EXAMPLES OF NDUSTRIAL EDUCATION

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BY

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One example is worth a thousand arguments. — GLADSTONE

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PREFACE

It is not to be doubted that we are in the midst of a complex and gigantic movement, somewhat indefinite and indistinct as to its direction and its ultimate results, but certainly involving great social and industrial changes and promising universal betterment. The forces which are bringing about these changes seem to be dominated by the desire to secure for the less prosperous members of society a larger measure of comfort and happiness and a more abundant life.

There is probably no single agency which has had so many demands made upon it to help in the solution of the problems which this great movement is presenting as has the public school, and the response which it has made to the demands should be a matter of pride to those who believe in the great mission of this most important of democratic institutions.

It must be admitted, however, that, in the securing of a fair opportunity for all to attain reasonable happiness; in the necessary reduction of poverty, unemployment, and delinquency; and in the promotion of individual efficiency and social solidarity, the schools have only a fractional part of the responsibility. To reach the results for which the promoters of industrial education are so enthusiastically working, society must coöperate in securing the enactment and the adequate enforcement of wise child-labor and school-attendance laws, and the improvement of working conditions in general.

Though this volume deals with only a fractional part of the whole problem, the author believes it to be a most important

part. The educators of the country wield an immense influence, and this influence will be increased rather than diminished when, by dealing successfully with a practical problem closely related to the lives of the people, they convince the public that they are not dominated alone by their interest in scholarship and disinterested truth and knowledge, but by a desire to advance in every way possible the social and moral welfare of every child committed to their care.

It is hoped that by bringing together the accounts of several examples of public industrial schools and classes, — the visible and tangible proofs that educators are applying themselves to the solution of the problems to which we have alluded, — this volume will serve to stimulate other and even more successful efforts to advance the movement for popular and universal education.

The author makes no apology for drawing so liberally on the utterances of others, but rather takes this opportunity of acknowledging his indebtedness to the many friends who have allowed him to use their valuable material. Whatever may be the reader's attitude toward the opinions and theories expressed by the author, he is urged to examine this material with care and to attempt to interpret for himself the several examples of industrial education which it describes.

FRANK MITCHELL LEAVITT

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CHAPTER I

SIGNIFICANCE OF THE MOVEMENT FOR INDUSTRIAL EDUCATION

The movement for industrial education is a part of a great educational advance which extends over the whole civilized world. It results from the attempt to bring about universal and appropriate education. It frankly recognizes that all cannot have and do not need the same education. It takes cognizance of the enormous increase in the sum total of human knowledge and art which the last century has brought, and the ever-increasing gap which separates this sum total from the capacity of the most receptive and most assiduous student. It is strongly influenced by the principle that, in making the selection of the knowledge and art which any individual or group of individuals should acquire, the vocational purpose should be second only to the moral and social purposes, with which, in fact, it is rarely in opposition. Thus vocational education is the larger term and includes professional, commercial, and agricultural education, education in domestic arts and sciences, and industrial education. It is to the consideration of this latter phase of modern educational advance that our discussions are to be specifically directed.

Industrial education means the complete and appropriate education of industrial workers of whatever grade. It therefore means much more than the introduction of shopwork into the

present curriculum, — the addition of another subject, however important that subject may be. It means a thorough revision of our school system with the purpose of furnishing for the working classes an education which bears somewhat the same relation to their prospective life work as does the college education to the future work of the professional and managerial classes. It means that, at whatever grade it may be introduced, it will be a type of secondary education, and will presuppose a basis of general cultural training and provide for considerable variety in both the length and the breadth of the special superstructure. It means reality. The word "reality" is used here in contradistinction to artificiality. Industrial education, therefore, provides participation in, rather than fancied preparation for, some activity. It means practice in real work for real people as an effective medium of education. It means, in the final analysis, the fitting of a particular boy for a particular job, and it is therefore strongly individualistic.

For the student of education it means the study of real conditions, — not alone the conditions of children in the schools, but also, and perhaps primarily, the conditions of children who, in the past, have benefited the least from formal education. He must be interested to study the children who lag as well as those who progress, those who can spend little as well as those who can spend much time in school training, those aiming toward the market, the shop, or the farm as well as those preparing for college. He must inquire at what ages children leave school and for what reasons; what they do after leaving, and with what profit or success. He must make a study of industrial methods and developments, and of the industrial and social opportunities open to the rising generation.

He should endeavor to make careful and specific adjustment of educational principles and practices to these conditions, and to work out in detail courses of study suitable for typical cases.

While industrial education is specific rather than general, it is desirable to examine some general principles in order to establish a basis for comparison and standards of measurement.

The problem which confronts us is a social problem. It involves the study of the evolution of industry, —a knowledge of the varying conditions under which people have lived and worked, and especially their chances for safety, comfort, and progress. This will lead the student of education to the consideration of the present status of the industrial worker, of industrial systems, and of organizations of capital and labor. It will show him that the movement for industrial education is itself evolving, and that therefore we should not seek finality but rather should try to discover the *nature* of the *present need*, the *kind* of training required to meet it, and the *agencies* which can best furnish this training.

In the restricted meaning of the word "education" this is also an educational problem, that is to say, a problem for the schools. It is therefore important to determine to what extent it is a problem of *general* education and to what extent a problem of *special* education. In other words, it should be decided to what extent it may be afforded by our existing types of schools, and to what extent special institutions must be provided. It will thus involve at least a superficial study of the history of American education in order that the trend of the people's schools may be seen and appreciated.

At the outset the real problem which the mere name of our subject indicates should be frankly admitted.

Industry is concerned primarily with material production.

Education is concerned primarily with the unfolding of human powers.

The mainspring of industrial development has been the desire to produce more and better goods at a decreased cost. While this effort has resulted in commendable expenditure of

energy, ingenious invention, and the beneficial economy of marvelous organization, frequently it has led to systematic exploitation, — the exploitation of our soil, our forests, our mines, our rivers, and, lastly, our children.

With all the errors which organized education has ever made, its ideal has been the unfolding and perfecting of all that is best and highest in human nature. Its mainspring has been the belief that the conservation of the child's best powers and resources was to be attained by submission to a constantly increasing period of school attendance.

So industry, at its worst, stands for exploitation, while education, at its best, means conservation. Thus there is here a genuine problem, according to Dr. Dewey, who says that "a problem is genuine just because the elements, taken as they stand, are conflicting."

It is fundamentally important to discover where these two are consistent and where antagonistic, and when this is done the duty of the educator will be quite clear. It is safe to say that his ideal, as stated above, will need no modification, but his judgment regarding educational values and his ideas regarding educational methods will doubtless undergo some modification.

In addition to recognizing the genuine conflict between the primary incentive of industry and the final end of education, it is also essential that the extreme complication of the problem be constantly kept in mind. It is obviously impossible to attack the problem from all sides at once, yet conclusions regarding any one phase of the question may be subject to modification when examined from another viewpoint. The complexity will be apparent if one reflects on the following questions, which indicate points of view from which the subject might be approached.

Can the principle of the elimination of waste, which has been so productive of advance in the industrial world, be applied with equally good results to educational activities?

What interests have capital and labor in the movement for industrial education? To what extent are they identical, and in what respects are they antagonistic?

What has been the traditional attitude of wealth toward popular education?

Have we classes in American society? Admitting the possibility afforded the individual of passing from one class to another, what are the probabilities that any considerable proportion of wage earners can ever change their status to that of employers?

What relation, if any, exists between industrial progress and the evolution of the school system?

What part have the schools taken in the application of art and science to modern industry?

To what extent is our present division of elementary and secondary education fortuitous, and to what extent the result of purposeful planning?

What is demanded of education in a democracy?

What educational practices of to-day most clearly indicate the trend of popular education?

Are the present standards of the schools in keeping with existing social and industrial conditions?

If these and similar questions were pondered by all educators, there would be such a revision of educational ideals and methods as the country has never yet witnessed. In fact, the present movement for vocational education is the best indication that these questions are now engaging the serious consideration of the thinking educational world.

It is not the purpose of this volume to discuss specifically each of the questions suggested above. It is believed, however, that one who finds his major interest in any one of these questions will discover in the following pages something vitally related to it.

It is from a study of such questions that one becomes convinced that radical educational reform is imminent and inevitable. It is evident that our present school systems are out of harmony with social and industrial organization.

Some of the more pertinent facts relating to the social organization may well be briefly considered. First of all will be found the wage system itself. As we know, the system places upon the individual the responsibility for his own and for his family's support. It is individualistic, not socialistic. It works well for the fortunate, but for many unfortunate it has worked such evil that it is frequently referred to as "wage slavery." At all events, it has produced two distinct classes with interests apparently widely divergent, if not diametrically opposed,— the employers and the employed. We find also that it has led to an exceedingly unequal distribution not only of wealth but also of opportunity for securing personal happiness, comfort, and satisfaction in the fundamental experiences of life.

Dr. Lyman Abbott, in an article in *The Outlook* of August 6, 1910, says: "In the second place, this wage system inevitably creates a concentration of wealth. It creates a small class of more or less, and generally increasingly, wealthy men, and a large class of more or less dependent men. The startling facts are thus given in Charles B. Spahr's book on 'The Present Distribution of Wealth,' the best book, I think, on the subject in the English language: 'To sum up the whole situation, therefore, it appears that the general distribution of incomes in the United States is wider and better than in most of the countries of western Europe. Despite this fact, however, one eighth of the families in America receive more than half of the aggregate income, and the richest one per cent receives a larger income than the poorest fifty per cent. In fact this small class of wealthy property owners receives from property alone as large an income as half our people receive from property and labor.'"

Another series of pertinent facts are those relating to the minute subdivision of labor which is characteristic of modern manufacture. These are set forth with great clearness in *Bulletin No. 8* of the National Society for the Promotion of Industrial Education. The following quotation from page 21 is illustrative :

"Let us compare some interesting figures relative to the saving in time and labor in shoes made by machines over those made by hand. Comparison is made in number of workmen employed, operations performed, hours of labor and cost of labor, in manufacturing 100 pairs of men's medium-grade calf, welt, lace shoes, single soles and soft box toes, in 1863 and in 1895. In 1863 manufacturing these 100 pairs by hand necessitated 73 operations by one workman, with approximately 1831 hours of work, at a labor cost of about $458. To make the same number of shoes of similar grade in 1895 by machine, there were 173 operations, 371 workmen, the time being approximately 234 hours, and the cost of labor $60. In manufacturing cheaper shoes the saving in time and labor in the machine product is even more striking."

From the foregoing it becomes evident that the determining factor in industrial control is the ownership of the tools or machines, and that, as this ownership is in the hands of the comparatively few, the status of the mass of the wage earners is relatively permanent.

If, with these social and economic conditions in mind, we examine our public-school systems, we are led to conclude that the ideals and machinery of a "leisure-class" education still persist to a very considerable degree. Particularly convincing are those facts relating to the retardation of pupils in the public schools, and the final elimination of a very considerable proportion of them without any adequate education whatsoever. A publication of the Charities Publication Committee, New York,

entitled "Laggards in our Schools," by Leonard P. Ayres, contains an enlightening exposition of this subject. It shows the difficulty of making any unqualified statement regarding retardation and elimination, but it forces the conviction that our present methods are failing with half of the children confided to the care of the public schools.

It is therefore to the problem of providing an adequate and appropriate education for the industrial workers that the following chapters are specifically addressed.

Other studies relating to the subsequent vocational experiences of these "laggards" lead to the conclusion that the schools have not only failed to awaken in large numbers of their pupils an interest in study but have engendered a distaste for work of any kind, particularly for manual work. These young people seem to have received no training in the schools which helps them to cope with the peculiar difficulties of their social and economic environment, but, on the contrary, it appears that the attempts to "educate" them have actually contributed to their failure in the industrial world.

CHAPTER II

MANUAL TRAINING AND INDUSTRIAL EDUCATION

From the foregoing chapter it will readily appear that the movement for industrial education is so vast, and its ramifications so numerous, that confusion and misunderstandings are inevitable.

One factor which has contributed to this confusion has been the indiscriminate use of the two terms "manual training" and "industrial training." A very considerable number of school men to-day employ these terms as if they were synonymous.

Recent attempts have been made, notably by the Committee of Ten of the National Society for the Promotion of Industrial Education, to formulate such definitions as would serve to completely differentiate the terms, but the results have not been wholly successful. It is not our purpose to fix definite limitations, but rather to sketch the development of the general movement which includes both manual training and industrial education. It should be possible to determine in which portion of the educational field each is most effective, and which portions they occupy in common.

At the very inception of the manual-training movement will be found the vocational idea. Speaking quite generally, this is also true of all types of American schools. Our existing high or secondary schools, so-called, were originally established with a vocational purpose clearly stated or implied. For example, let us note the development of the high schools in Boston, since the oldest free public school in the United States, and one in which traditional education holds full sway, is included in that system. The Boston Latin School was, and is, a vocational school, more

truly vocational than many of the manual-training and industrial schools throughout the country. It was founded as a preparatory school for Harvard College, which, in its turn, was established to train men for the ministry, in order that the colony might not have an illiterate clergy. Naturally many changes in the public-school system have come about since the establishment of this school (April, 1635), and it should be noted that these changes have been demanded by the public, and usually have been enforced by legislative enactment. To the Latin School there have been added the English High School, originally planned to fit for nonprofessional life; the Mechanic Arts High School, originally planned to fit for the industries; the Commercial High School for Boys; and the Practical Arts High School for Girls, whose names clearly reflect their purposes.

Returning specifically to the introduction of manual training, it is important to note that not only was the vocational idea prominent in the establishment of the Mechanic Arts High School in Boston, but that the same was true of the manual-training high schools in St. Louis, Chicago, Toledo, Cleveland, and Philadelphia, which preceded it.

The immediate impulse for this movement may possibly have been found in the Philadelphia Exposition in 1876. Here was shown the laboratory method applied to the teaching of the mechanic arts, as employed in the Imperial Technical School at Moscow, Russia. Two of the pioneers of manual training in this country, Professor John D. Runkel, at that time president of the Massachusetts Institute of Technology, and Professor Calvin M. Woodward, of the Engineering Department of the Washington University at St. Louis, saw this exhibit and made such recommendations as resulted in definite action by these two institutions. The Massachusetts Institute of Technology established on August 17, 1876, a department known as the School of Mechanic Arts. This was opened to boys of high-school age,

and was continued for several years, finally being abandoned when the Mechanic Arts High School was about to be established by the school board as a part of the public-school system of the city of Boston.

The Manual Training School at St. Louis was established on June 6, 1879. From the first it has received boys of high-school age, preparing its pupils not only for higher technical schools but also for commercial and industrial pursuits.

In January, 1884, the Commercial Club of Chicago established and endowed the Chicago Manual Training School. In 1884 courses in manual training were organized for the high-school pupils of Cleveland. This was done under private initiative, and the work was continued until 1892, when the city established manual training as a part of the free public-school system. In the same year Toledo established courses of manual training to be given in connection with the public high school, using for this purpose a certain trust fund. In this year, also, Baltimore established a similar school.

By 1893 manual training had been introduced into the high-school curricula, instruction being given either in separate schools or in the existing schools, in many cities, notably, in addition to those already mentioned, Cambridge, Fall River, Springfield (Massachusetts), Boston, New Orleans, Wilmington, Providence, New York, Albany, Omaha, Carson City, Washington, Chicago, Indianapolis, St. Paul, and Minneapolis.

Not only was manual training established in high schools, but efforts were made very early to secure its introduction into the elementary schools. One of the most far-reaching influences of the Swedish sloyd system is to be found in the insistence of its early advocates that handwork was an essential in the education of *young* children.

Here, too, private munificence and enterprise were important factors. As early as 1882 classes were established in the public

schools of Boston, supported by the generosity of Mrs. Quincy A. Shaw, and a Manual Training Committee was appointed by the school board in 1884. Within ten years manual training, in the form of woodworking, had been introduced into the elementary schools of many cities. Among them may be mentioned Washington, New Haven, St. Paul, Montclair, New York, Jamestown, Cleveland, Boston, Brookline, Springfield (Massachusetts), Chicago, Waltham, and Salem.

Whether in elementary or in high school, the work proposed by the earliest advocates of manual training was urged because of its vocational significance. In the report of a public-school board in 1878, occurs the following:

"The question of teaching trades in our schools is one of vital importance. If New England would maintain her place as the great industrial center of the country, she must become to the United States what France is to the rest of Europe, the first in taste, the first in design, the first in skilled workmanship. She must accustom her children from early youth to the use of tools, and give them a thorough training in the mechanic arts."

The interest awakened by the novelty of this new type of school work soon divided the opinions of school men. Probably the majority were indifferent; some assumed the attitude of active advocates, and others that of vigorous opposition.

Those who opposed the introduction of manual training took the ground that the purpose of public instruction was to develop general culture rather than to provide for vocational efficiency. The school was to develop character and general intelligence.

The advocates of the new education were thereby led to emphasize what they conceived to be the cultural value of constructive work. It was said that "the entire history of man, if examined carefully, finally reveals itself in the history of the invention of better tools." It was pointed out that man was

distinguished from all other creatures by his ability to use tools, and that the stages in his development had been marked by the increasing degree of excellence to which these tools had been brought. It was seen that tool work afforded relaxation from the tedium of purely intellectual book work, and also offered opportunity for another form of expression and thereby supplied serious defects in the education of that day.

Following the example of its prominent advocates, the teachers of manual training very early began to deny that the practical value of the work was paramount, and to insist that their function, like that of the teachers of Greek and Latin, was to develop the character of the pupil, not to increase his potential economic value. They said, "We are not teaching a trade, we are educating children; not teaching them to earn a living, but teaching them to live."

Another circumstance which contributed to the formulizing of manual training was the advent of educational psychology. Students of manual training and of psychology felt that the subjects were vitally related. Attention was diverted from the obvious, practical benefits of handwork to the subtler and more far-reaching results which, they said, could be fully revealed only by reference to physiological psychology. The interrelation of the mind and hand, the coördination of the intellectual and physical, formed the basis of many public discourses and the more or less clearly defined groundwork for courses of study.

The result of this discussion was to establish the claim that manual training had a distinct cultural value, and it is probable that it was because of the general acceptance of this proposition by educators that the new form of educational activity was so speedily and generally established.

The acceptance of the theory of the educational value of manual training did not, of course, insure its immediate or adequate introduction into the school system. Conservatism of those

in authority, the lack of accurate information, the impossibility of securing a sufficient number of competent teachers, and the very considerable expense of equipment and maintenance, — all contributed to keep accomplishment far behind accepted principle. Nevertheless, many schools and classes were established and few have ever been discontinued. In some school systems a pupil may now receive manual training from the kindergarten through the high school. Much intelligent thought has been expended on determining the content of courses of study and the disciplinary value of methods of instruction. On the whole there appears to be much justification in facts for such statements and definitions as are found in the following quotations:

"To cultivate the hand and eye is to enlarge the material for thought and the food for thought."

"Manual training gives the individual more complete command of himself and a keen sense of physical realities, more practical control of "things" and physical processes, a sense of the social significance of industries, more social intelligence and social enthusiasm, and the capacity to sense accurately, to think truly, and to judge logically."

"Manual training is needful for every individual irrespective of his calling or professional career. The boy in the grades or in high school is sent to the school shop, not because he is to be a carpenter; he is sent there, though it be already clear that he is to be an attorney or a physician or a clergyman."

"Clear reason, self-control, stability, equilibrium of character, strong will, and wise accommodation of the thing wished for to the conditions of life are the characteristics by which all human efficiency is attained. Psychology has recognized with perfect clearness the conditions under which these characteristics can be developed; when this knowledge has once gained a victorious entrance into pedagogy, then the old motto of the school workshop at Leipzig will become a motto for every school and

educational institution: 'Train the eye, exercise the hand, strong will be the will, clear the understanding.'"

"Simply as an aid to coördination, manual training would justify itself, were that the sole point of its educational bearing. As a matter of fact, however, this is its most elementary utility. It serves much higher uses in bringing out individuality, in awakening desire for learning, in stimulating the will to take complete and wise command."

"It is only when one has experienced the shock of misfit between what he has thought will hold, on the one hand, and what he finally finds to be true, on the other, it is only then that one is really sharpened to the point of developing good judgment. Leave out the test of practice, and people can think all sorts of things and be entirely wrong. We need headers such as practice brings, in order to develop sanity or efficiency. Manual training, because it provides this test, is superior to many other subjects. A well-educated man is one, therefore, who can do as well as know, and efficiency is a good term for the statement of the aim of education, because it includes these two factors."

"Manual training is any form of constructive work that serves to develop the powers of the pupil through spontaneous and intelligent self-activity. The power of observation is developed through exacting demands upon the senses, the reason by constant necessity for thought before action, and the will by the formation of habits of patient, careful application."

"In many instances manual training has so vitalized the school work, or has so infused new interests into the minds of many boys that they reveal an added interest in other subjects."

"One of the chief values of shopwork, weaving, gardening, etc., even in elementary schools, is that they introduce the pupil to natural facts and forces and give him a motive for becoming thoroughly acquainted with the concrete facts and laws of nature."

"Now manual training leads all other school work in its power to develop fidelity to ideals, because our work remains as a visual tangible thing, just as we have made it."

"The manual-training department of the school offers to the adolescent child an excellent opportunity, in many instances, to discover his individual and peculiar bent of mind or proclivity."

"Manual training in the shop satisfies this deep longing to be doing something with the hands. It makes amends for the great wrong done boyhood in transporting it to the city."

"On the intellectual side our school manual training develops distinctly the power to grasp an idea and embody it, — equips the boy with a wide knowledge of methods, devices, recipes, and machines for accomplishing the ends of art."

"The best values in manual training are in the habits, ideals, and attitudes it fosters. It interests many pupils who are not successful in other school studies, gives a sense of capacity, power, and effectiveness to many a boy who is almost ready to accept the teacher's estimate of his incapacity and worthlessness."

"The fact that manual training offers a change of work amply justifies its introduction into the crowded school curriculum."

"The purpose of manual training is to secure a vigorous mental reaction through the pupil's manual activity and through his interest in the constructive problem. Benefit to the worker results only when this reaction is real and vital."

If asked to state the purpose of giving instruction in manual training, most teachers of the subject to-day would urge one or more of the following, with greater or less elaboration: to develop manual skill; to create an interest in industries; to promote the coördination of the mind and hand; to provide a corrective for a too bookish education; to provide another approach to the mind; to provide another means of expression; to enable one to apply the test of practice.

Thus manual training has ultimately gained general acceptance in the public schools of the country, quite apart from any utilitarian consideration whatsoever. Meanwhile other agencies than the schools have been at work, and the result has been a *renewed* demand that *industrial* education be actively promoted by the state. This demand will be more fully analyzed in other chapters, but it must be noted in this connection that prominent among these agencies are the report of the first Massachusetts Industrial Commission in 1906, the formation in 1906 and the subsequent activity of the National Society for the Promotion of Industrial Education, and the Washington meeting of the Department of Superintendence of the National Education Association in 1908.

The report of the Massachusetts Commission on Industrial Education was made nearly a quarter of a century after manual training was first introduced into the schools of the state. This report has perhaps done more to shape thought and action throughout the country than any other volume which has been written on the subject of industrial education, yet it devotes less than half a page to manual training and disposes of it as follows: "It [manual training] has been urged as a cultural subject, mainly useful as a stimulus to other forms of intellectual effort, — a sort of mustard relish, an appetizer, to be conducted without any reference to any industrial end. It has been severed from real life as completely as have the other school activities. Thus it has come about that the overmastering influences of school traditions have brought into subjection both the drawing and the manual work."

The meeting at Washington produced a profound impression on the educational thought of the country. Addresses by James E. Russell, dean of Teachers College, Columbia University; Edward C. Elliott, professor of education, University of Wisconsin; James F. McElroy, consulting engineer,

Consolidated Car Heating Company, Albany, New York; and Miss Elizabeth Euphrosyne Langley, School of Education, The University of Chicago, called attention to the real meaning of the retardation of pupils in our public schools, and the final elimination of a large proportion of them before the completion of the work of the elementary grades. It was shown conclusively that these eliminated pupils were the ones for whom industrial education should have been provided.

It is also for the education of those not adequately served by the traditional schools that the National Society for the Promotion of Industrial Education is conducting its effective campaign.

It should therefore be clear that the Massachusetts Commission was partly in error in saying that manual training had no industrial value. When it is recalled that manual training was first introduced into the high schools, and was only tardily extended to the upper grades of the elementary schools, and that a large proportion of the pupils needing industrial training leave school before reaching those grades, it will be readily understood why manual training has seemed to so many to be ineffective and without vocational value.

It is undoubtedly true that if the manual training, even though it has been "brought into subjection" by the "overmastering influence of school tradition," could be given to these retarded and eliminated pupils at the right time, it would be found to have a considerable industrial value. It would be as stimulating to these as it has always proved to be for the more successful pupils. At all events it will continue to form a part of the curricula of existing schools with a wider rather than a narrower scope.

That industrial education means something else and something more than the introduction of a minimum amount of handwork into the schools has already been stated, and to the consideration of this larger phase of the subject the following chapters will be addressed.

CHAPTER III

THE DEMAND — AN ANALYSIS

We have seen that manual training received its original impetus from a demand for industrial education, but that, through maladjustment to school organization, it failed somewhat of its purpose. Recently a renewed demand has gradually become apparent. Failure to understand the nature of this demand has already caused much unnecessary confusion and misunderstanding even among those who are earnestly striving to meet it. An analysis of this demand, which is far more complicated than was commonly supposed a decade since, is thus of primary importance.

Demands have come from the manufacturing interests, from organized labor, from educators, and from societies formed to promote the social well-being of men and women. To these might be added the demand of the youthful workers themselves, though this demand is implied in actions rather than stated in words.

It is impossible to say which of the active agencies has led and which followed. It is certain that one of the first industrial schools in the country was established and supported by a labor union; yet, after a careful study of the demand of organized labor, it is difficult to escape the conclusion that labor's chief interest in the movement arises from a desire to control it, as far as possible, for the purpose of regulating the labor market in the interest of organized labor, and, as it believes, of humanity. That this desire is consistent and, under the circumstances, justifiable does not change the facts.

Associations of educators have been much interested for the past few years, if one may judge by the number of papers on the subject noted in the programs of their conventions; yet it seems, in many cases, as if educators were restating rather than making a demand. This impression gains strength when one compares their statement of the problem with their suggestions for its solution, for these rarely seem to be consistent.

On the whole, inasmuch as the forces behind each movement for the enlargement of the function of the public school have been sociological rather than pedagogical, it seems probable that the demand has come primarily, or at least most effectively, from the manufacturing and commercial interests.

The Demand of the Manufacturers

Manufacturers are insisting that industrial education is needed for the salvation of our industries and the maintenance of the industrial supremacy of the country. Statistics are not wanting to show that we enjoy, or have enjoyed, such supremacy. If we have, how was it attained? We had, at the time of our greatest industrial expansion, certain tremendous advantages over all others. We had a profusion of cheap raw material, much available water power and water transportation, virile native workmen of great adaptability and trained by means of our own apprenticeship systems, large numbers of skilled workmen from European countries, and later we utilized, not to say exploited, an abundance of cheap child labor.

During the past fifty years these advantages have gradually become less marked. Raw material has been wasted and monopolized. Skilled labor is relatively scarce. The remnant of the apprenticeship system has little influence on the supply of trained workers. The character of immigration has radically changed, and the skilled workmen of Germany, England, and

Scandinavia are no longer attracted to our shores in large numbers, because the opportunities for advancement here are not sufficiently superior to those of their own countries. Efforts to prevent the exploitation of child labor are meeting with ever-increasing success. With the disappearance of former advantages, the manufacturer is forced to reduce the cost of production wherever possible, and his demand for industrial education is an attempt to eliminate the unprofitable period of apprenticeship.

It is true that the changes brought about in industrial methods, through the introduction of machinery of more and more complicated and automatic type, have made it possible to employ effectively a large number of unskilled or low-skilled workers, and of these there is no dearth. But the demand of the manufacturer to-day is for the higher grades of labor. Apparently he will be satisfied if the public schools succeed in training for him a large number of the most intelligent boys and girls for the better industrial positions. His plans for industrial education rarely touch the relatively unintelligent and wholly unskilled, who leave the schools in such astonishingly large numbers, at from twelve to fifteen years of age, and enter the lowest grades of industrial employment. At best these plans contemplate opportunities for a very small percentage of such children, and these the most able.

It is obviously unjust to maintain that all manufacturers are actuated by purely selfish motives in advocating industrial education, for of course they differ in their attitude toward their social duty; but the following quotations will show with sufficient clearness that the manufacturers are concerned primarily and naturally with the material product and only incidentally with the problem of education.

In response to the question, "Why do you believe in industrial education?" the following answers have been made by manufacturers.

"Because my company employs about one thousand men, and we need men of better skill."

"Because in every branch of industry with which we are familiar, it is impossible to obtain efficient workers to take the place of skilled men who are dropping out from death and disability; and as a nation in competition with others, Germany in particular, we are bound to suffer seriously on this account."

"Because we employ a large number of boys, and the present school system is turning out boys who do not want to work with their hands."

"Because I feel the necessity of a more practical education to be given through our public schools. Book education has been pressed to its limit by educational people, and is not based on practical business experience."

"Because 85 per cent of the pupils now getting their schooling are being crammed, well-meaningly, with a mass of knowledge which is not practical."

A large manufacturer in a small community felt that, inasmuch as he paid a large share of the taxes, the school ought to make some return to him for his money, by giving definite instruction in matters pertaining to his particular industry.

A manufacturer of sufficient importance to obtain a place on a recent program of the National Education Association made the following statements in an open letter.

"How can we make our schools, upon which we spend more money than any other people, fit our children for their life work, and furnish our industries, the source of our national wealth, with their army of skilled and willing workers? The leaders of educational thought have been at work during the last century in creating our public school as it exists to-day, in formulating methods of instruction in reading, writing, spelling, history, and geography, that is, for teaching book subjects. Our professional educators are too much cut off from contact with active life to

feel the need of our time. Business men, conscious of the crisis, must give the impulse."

A manufacturer, prominent enough to be president of the National Association of Manufacturers, says: "The call for us to round out and extend our educational systems is more imperative than was ever issued to any other people in the world's history. We must be equipped to rise to an opportunity such as was never before offered. While we have but 5 per cent of the world's population, we produce

25 per cent of the world's gold
33 per cent of the world's coal
38 per cent of the world's silver
40 per cent of the world's iron
42 per cent of the world's steel
52 per cent of the world's petroleum
55 per cent of the world's copper
70 to 75 per cent of the world's cotton.

"There are three ways in which we can dispose of this wealth. We can let the other countries manufacture for us the raw products, or we can import foreign mechanics, or we can educate our sons to shape these materials into finished fabrics and to become sellers of these articles to the rest of the world."

Another prominent manufacturer voices his opinions regarding education and industry as follows:

"I consider trade schools a just charge on the public treasury, much more so than the advanced teaching now given, which I think has been carried too far. I believe a large amount of the money spent in high schools would be better spent in adding industrial training to the grammar schools. . . . I favor, decidedly, schools conducted by or under the auspices of manufacturing concerns. . . . If a manufacturing concern claims no moral obligation, but states that the only claims on its

graduates will be the attractions to its service offered after the schooling, I believe the state would do well to assist such a school by advice, and, under certain local conditions, by a money grant, if required standards are maintained."

Some manufacturers are advocating industrial education as an effective weapon in the warfare between capital and labor. While this phase of the question has not assumed important proportions so far as actual accomplishment is concerned, the persistent attitude of the National Association of Manufacturers cannot be entirely ignored. It is an attitude of utter hostility to labor unions and a denial of their right to a voice in the final settlement of the complicated questions involved in this movement. It asserts the paramount interest of the manufacturer. The last annual report of the president of this association (May, 1911) contains the following paragraphs:

"This association, along with others, has for a number of years strongly advocated a system of manual and technical training as part of the general educational system of the country. But it has not, nor does not now, overlook the dangerous tendencies incident thereto; and by this I mean the danger of such a system falling under the influence and domination of the labor agitator."

"Militant unionism is the bitterest foe industrial education has got or ever had; yet under the impetus which the proposition has attained, and its apparent necessity, — if for no other purpose than to meet the restrictions placed upon our supply of skilled mechanics by the labor unions, — we find some of the labor leaders who are most responsible for the curtailment of our supply of skilled mechanics, and who stand unqualifiedly for its continued curtailment, taking a hand in and coming to the front in the movement for industrial education. And, unfortunately, we find men who are earnestly devoting their time, energies, and money to promote this important work, not only

willing to serve on boards and committees with these labor leaders, but apparently impressed with what seems to me to be an absurdly false and erroneous idea that those men, with their persistent antagonism to the vital principle of industrial education, are essential to its advancement."

"I have not the slightest patience with a policy which seeks the accomplishment of a good purpose through the aid of men who stand for a bad cause and who are avowedly the enemies of that purpose; men who authoritatively represent less than 5 per cent of the laboring forces of the country, and those by no means the better elements, and who woefully misrepresent all the balance. I care not what the pretenses of such men may be, nor how often they may escape the penalties of the law for their violation of it. I feel, however, I am safe in saying that the antagonism of this association to the closed shop and the methods employed to establish it is too strongly intrenched in the minds of its members ever to permit of any mixing up with the labor trust in its policy with respect to industrial education."

"Now, whatever may be said or whoever may take part in this problem of industrial education, it is the manufacturer who must steer it to a practical solution; without him it can amount to but little more than a delusion and a farce. It is the associations of manufacturers that have given the subject its present impetus."

This particular aspect of the demand of the manufacturers, related as it is to the demand of organized labor, can be discussed more intelligently in the succeeding chapter.

CHAPTER IV

THE DEMAND OF ORGANIZED LABOR

As previously stated, organized labor has been interested for many years in the subject of industrial education. It claims, with some reason, that this interest is most vital to its members, being closely related to the very existence of their organization and to the maintenance of their present personal status. One of the most significant authoritative statements of organized labor regarding industrial education was made in November, 1910, by Mr. Charles H. Winslow when he said, "We do not beg it as a favor, but we demand it as a right."

But while organized labor demands industrial education, individual unions are more willing to say just what kind of training they do *not* want, than to outline a constructive policy. Labor unions also differ greatly from each other in their attitude toward the question, because of the variety of conditions obtaining in the several trades.

These facts make analysis of labor's demand peculiarly difficult, but perhaps no more comprehensive statement of its views can be found than the resolutions passed by the American Federation of Labor, authorizing the appointment of a committee to investigate the whole subject. These resolutions were adopted at the annual convention at Denver, held in November, 1908.

Whereas industrial education is necessary and inevitable for the progress of an industrial people; and

Whereas there are two groups with opposite methods, and seeking antagonistic ends, now advocating industrial education in the United States; and

Whereas one of these groups is largely composed of the nonunion employers of the country who advance industrial education as a special privilege under conditions that educate the student or apprentice to nonunion sympathies and prepare him as a skilled worker for scab labor and strike-breaking purposes, thus using the children of the workers against the interests of their organized fathers and brothers in the various crafts; and

Whereas this group also favors the training of the student or apprentice for skill in only one industrial process, thus making the graduate a skilled worker in only a very limited sense and rendering him entirely helpless if lack of employment comes in his single subdivision of a craft; and

Whereas the other group is composed of great educators, enlightened representatives of organized labor, and persons engaged in genuine social service, who advocate industrial education as a common right to be open to all children on equal terms, to be provided by general taxation, and kept under the control of the whole people with a method or system of education that will make the apprentice or graduate a skilled craftsman in all branches of his trade; and

Whereas organized labor has the largest personal and the highest public interest in the subject of industrial education, and should enlist its ablest and best men in behalf of the best system, under conditions that will promote the interests of the workers and the general welfare: Now, therefore, be it

Resolved, That the president in conjunction with the executive council of the American Federation of Labor, be, and is hereby, authorized to appoint a special committee of at least fifteen, to be composed of a majority of trade-union members of this convention, who will serve without compensation and incur no expenses other than necessary and legitimate expenditure within the judgment of the president and executive council, to investigate the methods and means of industrial education in this country and abroad, and report its findings, conclusions, and recommendations to the next annual meeting of the American Federation of Labor.

It is generally conceded, by Southerners themselves, that no question of public policy in the South can be considered entirely apart from the race problem. In much the same way, organized labor finds in every movement some connection with the supply and demand of labor. In the present instance labor discerns in the movement for industrial education a more or less concerted effort on the part of capital to capture the schools for the purpose of gaining a more complete control of the labor market.

That labor has ground for suspicion is clearly shown by the attitude of some manufacturers. In support of this proposition the American Federation of Labor quotes the following statement from the late James W. Van Cleave, a former president of the National Association of Manufacturers:

"I would attach a manual-training department to every public primary school in the United States, where, beginning at the age of nine or ten, under competent teachers, boys could devote an hour a day to the handling of tools. I would make the instruction compulsory. Thus at the age of fourteen the boy of average intelligence and application would be able to use many of the tools employed in those trades which are fundamental and important. Then I would have free industrial high schools where boys who had completed the primary course might continue their education. Two years at such a school would qualify a student to take his place in the world as a first-rate mechanic. *The supply of workers being certain and adequate, the labor-union embargo on our industries would soon be permanently lifted.*"

The reports of the Committee on Industrial Education of the National Association of Manufacturers for 1905 and 1906 express somewhat similar views as follows:

"It is the modern trade school, and that alone, that will make our American boys skilled artisans, educated mechanics, and hustling, adaptable, willing workmen, capable of filling any position."

"There are good reasons why it would be unwise to establish trade schools in this country at public expense. The initiative should be taken by corporations or private individuals."

"Technical and trade schools should have opportunities for teaching their students all the phases of practical work by producing manufactures of various kinds, which may be needed in the school, and, in addition, may be placed on sale to the general public."

"We cannot too strongly emphasize the certainty of disastrous results if American trade schools should be dominated by the labor unions."

"It is trade schools pure and simple that we are in need of to turn out good skilled workmen, who can take positions in their various specialties and acquit themselves creditably alongside of workmen from this or any other country."

"But knowing how sorely in need of skilled workmen we have been in this country during recent years, and considering the inefficiency of a large proportion of those now in the various trades, it seemed to us that such schools (private trade schools as commercial ventures) should be encouraged."

"It is plain to see that trade schools properly protected from the domination and withering blight of organized labor are the one and only remedy for the present intolerable conditions. In this connection it will not be out of place to again warn those interested in the promotion of the movement for trade schools, to be ever watchful and diligent in guarding against the possibility of domination by labor unions, since it has been their policy heretofore to do everything in their power to discourage and defeat all efforts made to establish trade schools."

"But we claim that such [evening] schools are established for the benefit of the boys who are not so fortunate as to be thus employed [as apprentices], and that under no circumstances should boys serving apprenticeships be permitted in the night classes, or for that matter in the day classes, to the exclusion of the boys not so employed."

"There is a claim frequently made by members of labor unions that trades cannot be taught as thoroughly and completely in a trade school as in the workshop, or on buildings, or wherever work is actually being carried on. Never was there a greater mistake. On the contrary, directly the opposite is true, with perhaps some rare exceptions such as locomotive building, which it

is not intended to teach in trade schools, at least not for the present. From the very moment the boy enters the trade school he begins the actual study and work pertaining to his trade, and is taught by competent instructors from the smallest detail to the highest principles connected with that trade, and he is not given his indenture papers until he has thoroughly mastered his subject. Of course it is reasonable to suppose that there would be a slight timidity shown by the boy when he starts out as a journeyman, just as in the case of a speaker who appears before an audience for the first time; but this, after a few days or weeks, will pass away, and the boy who learned his trade in a trade school will be able to teach the old-style workman a trick or two."

While the report of this committee for 1910 gives evidence of a broader and more social view than formerly taken, it leaves no room for doubt that there is a serious difference of opinion between capital and labor as regards industrial education.

From the foregoing it should be evident that organized labor has excellent grounds for the fear that industrial education may be administered in such a way as to strike at unionism's most vital principles. The leaders of labor, therefore, have a right, if not an obligation, to devote careful attention to this aspect of the movement. In general it may be readily admitted that the spokesmen of organized labor are demanding public industrial schools, partly because they feel a need of appropriate training for the coming generation, but primarily because they see that this will be the most effective way of regulating the movement in their own interests, and especially because they believe it will effectually prevent the subsidizing and the patronage of schools maintained or controlled by the manufacturers.

As citizens they can inquire into the nature of a school which a city or a state proposes to establish, and they exercise this right. As citizens they seek to regulate or even prevent such a

school if they feel that in any way it is antagonistic to their interests, and as citizens their opinion has weight.

It should be emphatically stated, however, that this is not labor's only interest in industrial education. The workingman may not be aware of the fact that in an average industrial community one fifth of the school money is spent in educating one twentieth of the children, but he is beginning to feel that his children are not receiving the education they most need, and he is expressing his conviction that the school work should be modified to more adequately meet that need. He wants "the right kind" of industrial education. The following quotations from prominent labor leaders are offered as a partial corroboration of the above statements.

"The public-school curriculum at present is based, in the case of the grammar school, on that of the high school. This I believe is a mistake. If one were to take the children of twelve and for two years teach them to use tools, they would find themselves better fitted for the battle of life."

"I am in favor of industrial education. The form I favor is that of the preparatory and practical. . . . I would have all trade schools open to all. I favor preparatory trade-school work under public auspices, but do not favor trade schools conducted by manufacturing concerns. I deprecate certain schools now organized, referring in this to correspondence and other trade schools which cannot give practical education, and, because of this, deceive both the student and the employer."

"Industrial education ought to provide for the children of the masses and for the great manufacturing and constructive industries something equivalent to what the states are now doing for the children of the well-to-do in fitting them for professional and managerial careers."

A man prominent in labor circles states that he has a large family and that his children will have to earn their living by

working with their hands. He recognizes the probable permanency of status of the wage worker. He desires that his children may begin a very definite trade training as early as twelve years of age, believing that ultimately they will be more successful in life than would be the case if they were to have a part or the whole of the traditional high-school training and then were to enter some trade without any preparation and with false notions about life and work.

Perhaps the majority of workmen may not agree with him. It is true that they frequently desire a liberal education for their children, but it is equally true that in a large number of cases the education is interrupted when the boy reaches fourteen or fifteen or sixteen years. Reluctantly abandoning the hope of a classical or professional training, they demand an industrial training that, to use the words of the report of the American Federation of Labor, will give the pupil "between the ages of fourteen and sixteen a course of instruction in English, mathematics, physics, chemistry, elementary mechanics, and drawing; the shop instruction for particular trades, and for each trade represented, the drawing, mathematics, mechanics, physical and biological sciences applicable to the trade, the history of that trade, and a sound system of economics, including and emphasizing the philosophy of collective bargaining. This," the report confidently adds, "will serve to prepare the pupil for more advanced subjects, and, in addition, to disclose his capacity for a specific vocation."

Labor has a program which it will undoubtedly reveal in the near future. This program will contemplate a longer period of education, with the compulsory school age raised to at least sixteen years. It will insist that no element of general culture now included in the elementary education be eliminated, and it will strive for such an education as will tend to prevent the segregation of classes.

It cannot be claimed that labor has made no mistakes in its attitude toward this new movement. Labor has criticized the trade school on the one hand and the manual-training school on the other, claiming that the first gave only a narrow training in mere mechanical operations, without the underlying science and technology, and that the latter afforded only theoretical knowledge, which in itself was of no practical value. These are partial truths and as such are dangerous. The fact is that both trade schools and manual-training schools have given training of great industrial value to thousands of students, even though neither school can exactly duplicate the training gained by actual experience in a trade.

Labor unions have sometimes objected to the practice of most industrial schools, of turning out a practical, finished product. The practice, while capable of undue and unnecessary expansion, is absolutely essential in many if not in most cases. It is encouraging that organized labor has at last placed itself on record as favoring "the minimum of production and the maximum of instruction."

Another mistake of organized labor is to be seen in its attitude toward the graduates or students of trade and industrial schools. The following resolution passed by the International Association of Machinists may be taken as illustrative of this kind of opposition.

Whereas the report of the international president calls attention to the threatened danger to our apprenticeship system by the trade schools of the country, which issue certificates to students as graduates in the several trades; and

Whereas such so-called graduates of trade schools are frequently used by employers to prevent men gaining a higher wage or shorter hours; therefore be it

Resolved, That the attention of our membership be called to this growing evil, and urged to refuse to assist such so-called machinists who may be engaged as "improvers" or "men under instruction" in acquiring a more enlarged knowledge of the business.

As is the case with the manufacturer, so with organized labor, greater liberality and clearer comprehension are to be noted in more recent utterances. The following quotation is at once proof of the opposition offered by trade-unions to students of industrial schools, and of the fact that clearer understanding is being reached.

James M. Lynch, president of the International Typographical Union, says: "A situation has arisen that we must meet. All the indications tend to the establishment of the opinion that the technical school is here to stay, and that its graduates are a factor that must be taken into consideration by the modern trade-union. If these apprentices, or partially instructed students, are not given opportunity to finish their trades in union shops, offices, mills, or factories, they will secure the needed finishing touches in the so-called open or nonunion shops, and there will be added to this a prejudice against the trade-unions because of lack of understanding of their ideas, methods, and practices. It is a big subject, becoming larger with the passage of time, and I repeat that it is a subject that must be met, and intelligently met, and whatever action may be taken to cover it must not be dictated by passion or prejudice. We must meet industrial development with trade-union development, and, if called upon, we must make sacrifices for a time in order that the general good may later be conserved. We must not confine our opinions and thoughts to to-day; we must look ahead and prepare for the morrow, and the morrow's morrow."

As a fair and disinterested statement of the real situation the following quotation from an address by Mr. Frank A. Vanderlip is submitted for thoughtful consideration.

"Some of us are apt to find much fault with the labor situation. We criticize the attitude of the trade-unions and the demand of labor organizers. Might it not be well to remember that we have created an industrial condition in which, in a very large measure,

one man's work is exactly like another's, and that in certain fields the work of all is largely automatic; that our industrial situation is doing quite as much as the labor organizers to reduce to a dead level of equality the value of man's time in certain industrial lines. If we want men who will think for themselves, must we not give them a training which will enable them to think correctly? If we want men to become attached to their work and their positions, must we not give them an intellectual interest in that work? If we want independence of thought in a workingman, must we not provide him with the opportunity to be something more than an automatic figure revolving without volition, interest, or active intelligence, as the wheels of industry revolve? From the point of view alone of the attitude of the workingman toward the industrial problems of the day, I believe we are doing less than our duty in the way of education and very much less than the selfish interests of capital would demand if employers had a clearer vision on this subject.

"If it can be demonstrated that this is the correct view, that moderate and wise administration of the great democracy of organized labor is more likely to follow if the masses of workmen are educated toward the better intellectual comprehension of the principles of the industries in which they are engaged, then what money value could be put in this country upon such a system of education as would ultimately give to organized labor wiser leaders? I believe that there is a profound and important truth in this view. If we drift toward a condition in which automatic workers live without intellectual interest in their work, we must expect them to follow, without independence of thought, unwise leaders along paths that will be destructive for capital and labor alike. If we offer educational facilities that will tend to train a considerable number of the youths following industrial callings so that they will better comprehend the nature of their work and its relation to the whole industrial organization, if we will provide

better schools that will awaken an intellectual interest in the day's task and kindle ambition which will lead men on to better work and greater contentment, we shall accomplish a step in the development of our educational system which will be of greater importance than any other change in educational methods that is now under consideration."

On the whole there is good foundation for labor's contention that it has the largest personal and public interest in industrial education. It is interested in the nature, amount, and disposition of the material product of industrial schools. If the practice of manufacturing a commercial product is adopted, it is feared that the school product might reduce somewhat the amount of work now done for wages.

In the second place, labor naturally desires to examine with care the possible effect of the proposed schools on the labor market. It wishes to be quite satisfied that they are not to be maintained primarily in the interests of organized and possibly unfriendly employers.

And finally, the American workman is interested in the effect of the movement on general education. He has been a stanch supporter of the free public-school system for more than a century, and he is inquiring whether the new schools will curtail, in any respect, his long-established rights to an educational opportunity supposedly equal to any in the land.

CHAPTER V

THE DEMAND OF EDUCATORS

It will be noted that many of the foregoing statements by manufacturers and by representatives of organized labor imply a certain criticism of the existing public schools. It is certain that the schools have been freely criticized, and the situation is not without its humor. For a generation the several rather distinct units in our school system have been critically examining the work of each other. The colleges have said that the quality of the preparation given in the secondary schools was steadily declining; the high schools have discovered a like downward tendency in the training afforded by the elementary grades; and even the teachers of these grades have felt and said that things were far better before the kindergartens were established. Meanwhile the public has listened, and it has now apparently decided to take us all at the estimate of our particular critic. It declares that all branches of the school system are inefficient and inadequate, governed by outworn and outgrown traditions and incapable of comprehending the conditions and needs of the times, and that, as a result, our training is unrelated to real life and therefore economically useless.

Some of this criticism is undoubtedly true in the case of individual schools and teachers, but there is a genuine misconception on the part of our critics. No business man who criticizes his newly employed elementary- or high-school graduate would think of employing, on an important law case, a man fresh from a law school, or of putting his life in the hands of a physician recently graduated from a medical school. In these

cases he recognizes that, unless supplemented by practical experience, no scholastic training, however liberal, will furnish all the requirements for immediate success. Yet it is exactly this *immediate success* that he expects in his errand boy, clerk, or operative.

As before stated, the chief concern of the educator is in the conservation of human power and resources, and it is, after all, the ability of the young worker to adapt himself, somewhat adequately and in a reasonable time, to the demands of his newly found position, which convinces the schoolmaster that his pupil's education has been a success.

Consistent with this ideal of the educator there is heard, more and more clearly, a *demand* from school men themselves, that our systems of education give more attention to training for vocations or for vocational life.

This educational demand is comparatively new, but when the study of modern pedagogical psychology brought teachers generally to see that education was something more than training children to memorize and thus accumulate knowledge, the demand on the part of the educator was ultimately assured. Guided by his ideal, and lighted by his more intimate knowledge of the human organism, and, on the whole, with very little interest in the needs of business or industry, he has come to see the cultural value of work and the psychological value of this direct appeal to the interest and activities of many of his pupils, particularly during the period of early adolescence.

When it has come to practice, however, the educator has recognized the value of industrial education as applying more particularly to those boys and girls who are not successful in the academic and traditional work of the school. In the beginning he was quite willing, and in fact desirous, that this training should be differentiated from the so-called "regular work," and that it should be given by some other agency than the public school.

He has even maintained that utilitarian work has no rightful place in our educational scheme, but this point of view is rapidly changing.

Even now, many educators wish to introduce industrial training with as little disturbance to the existing system as possible. They advocate a separate secondary school, and, for the lower grades, a school between the elementary and high, available for special classes. An excellent example of this attitude is afforded by the following statement by Dr. Charles W. Eliot, president emeritus of Harvard University:

"Industrial education ought to mean trade schools, and nothing but trade schools. . . . They [trade schools] involve new educational requirements on the part of society, requirements to a later age than we have been accustomed to. In most of our states fourteen years is the limit of compulsory education. These trade schools will require that children be kept under the observation of the community up to the seventeenth or eighteenth year, and be absolutely required to attend a continuation school, for part time at least, if attending no other."

The initial statement in this quotation must be recognized as extreme and dogmatic. It will not receive the indorsement of all school men. In fact, school men differ as radically as do the representatives of capital and labor regarding the place of industrial education in the general plan.

There are those who see in industrial education a cure for specific educational ills, as, for example, the evil of retardation and the final dropping-out of school of a large majority of our pupils at from twelve to fifteen years of age. In writing on this question an educator says: "In our educational organization and policy we have evidently failed to grasp the full significance of a prolonged period of infancy as a factor in the development of the individual and the race. . . . The real secret of the loss of pupils in the upper elementary grades is to be found in our

astounding failure to provide for some of the strongest psychological and social needs of many pupils as they approach these years. We take boys and girls at a time when their impulses are strong for active participation in the vital interests of life, and we confine them within narrow schoolroom cells with books and pencils as chief and sole means of participation; we take them when their desire for social coöperation is a dominant motive, and we require each to work for himself upon tasks which, so far as we can see, have little to do with the great world outside the school walls; we take them when their individual differences in capacity, interests, and prospective careers are properly matters of growing and vital concern, and we require them to pursue a uniform course of study having little direct relation to these specific powers, motives, and prospects. . . . The conclusion clearly indicated is, that adequate provision for vocation training, beginning at about the sixth year, would tend to prolong the school life of the great mass of children."

But there are a few educators who demand an appropriate training for industrial workers, basing their demands on even higher grounds. Such a one is Dean Russell of Teachers College, Columbia University. He bases his demand on the constitutional right of every American citizen to an equality of opportunity. He demands democracy in education, that is, the right of each individual to the kind and amount of education best suited to his nature and his social and economic needs. He says: "It is the boast, too, of most Americans that our great public-school system provides alike for every boy and girl taking advantage of it. This is half true and dangerous, as half truths are. The fact is, the American system of education grants equality of opportunity to those who can go to college and the university. It takes little account of the boy — and still less of the girl — who cannot have, or does not wish for,

a higher education. Ten millions of those now in our elementary schools, who will be compelled to drop out to earn a livelihood, will have missed their opportunity. But why? Do we in America have need only of professional men and men of affairs? Are those who pay the taxes and do the rougher work of life to be denied the opportunity for self-improvement? Are only those who can afford to stay in school to reap the advantages of an education? In a word, what are we doing to help the average man better to do his life work and better to realize the wealth of his inheritance as an American citizen? The questions raise the problem of vocational training for those who must begin early to earn their living. It is, in my judgment, the greatest problem of the future, and one which we may not longer disregard and yet maintain our standing as a nation."

This statement may not be accepted by all, especially by those whose interests center around the higher education. It must be admitted that the progress of the movement has been greatly retarded by those school men who have insisted that the peculiar purpose of the school is to provide culture and culture alone. Those opposing industrial education on that score apparently regard culture as if it were an "ingredient" in some compound, always the same, quite forgetting that the culture of yesterday may be brutality to-day. They have overlooked the fact that culture to-day is not merely something which makes for appropriate behavior in polite society, but is that which gives one an emotional appreciation of the meaning of our complex and cosmopolitan life.

The very natural conservatism of educators has led many of them to insist that nothing of vocational purpose excepting that which is common to the interests of every child should be permitted to enter into the pupil's education before his fourteenth birthday. They have asserted that no adequate foundation can possibly be laid before that time, and that children, with the

advice of their parents, cannot determine their life career at so early an age. Others have maintained that, while it may be a momentous question to decide between two or three different lines of educational and industrial work in the school, it is of far greater moment to decide to sever all connection with school whatsoever, and that upwards of two million two hundred fifty thousand children between the ages of twelve and fifteen in the United States to-day have decided that question in favor of complete separation from the school.

It may be said, however, of educators generally, that their acceptance of the teachings of educational psychology, which has led the schools to relax the rigidity of former systems of grading, to recognize the need of adapting education to the varying opportunities, abilities, aptitudes, and interests of their pupils, to revolt from the fruitless attempt to reach all through the same methods, or to force all to progress at the same rate, — that this acceptance has assured, on the part of school men, an acquiescence with the movement for industrial education which may be classified as a demand.

It must be confessed that this demand has been less insistent than that of the manufacturer, and one is sometimes led to feel that the educator has been blind to the people's needs and remiss in his high duty; that he has opposed where he should have helped, and followed where he should have led. Undoubtedly the greatest obstacle to the movement has been the attitude of the conservative educator, which has varied from open hostility to entire indifference. The opposition is apparently based on the belief that there is *one best education* which all, who possibly can, should be induced to obtain, and it is feared that any influence which may deflect children from the traditional path, will do more harm to our plan of general education than any vocational benefit to the individual can possibly offset. Whether the ultimate result of this opposition will be beneficial or

detrimental to the cause is a matter of opinion, but the opposition itself is a fact.

It is believed, however, as the question is studied more carefully, that the guiding hand and wise council of the educator will be more and more clearly apparent. He has insisted not only on equipping the worker for industrial life, but in so equipping him that he will be able to make that life better worth the living. He has stood more than once between capital and labor in their demands upon the schools, and he has organized, if he has not taught, the most successful of the numerous experiments in industrial education to be found to-day.

It is hoped that the descriptive chapters of this volume will show that, if there have been conservative educators, there have been also progressives, and that their demands have been more clearly expressed in actions than in words. They are to be found in every section of the country and in all parts of the educational system.

CHAPTER VI

THE DEMAND OF SOCIAL WORKERS

No study of the demand for industrial education is complete without some reference to the contributions made to the movement by philanthropic and charitable institutions and by reformatories.

The purpose of the social workers has always been the amelioration of the hard conditions of the unfortunate, and their efforts have been genuinely altruistic. These efforts have not always been marked, however, by scientific methods, and it is only within a generation that the emphasis has been shifted from the necessity of "giving" to the necessity of "training." Furthermore this training has come to mean training for *work*, and the object has been to furnish the means of self-support.

As a result social workers have been among the first to make a real study of the actual conditions under which the less fortunate of the industrial classes live and labor. The facts have been accumulated and systematized, and have been of fundamental importance in the development of social "science."

The search for pertinent truths has sent the investigators into the homes and into the industrial establishments. It has sent them to statistics regarding immigration, school attendance, and prisons. Complete and accurate information has been demanded.

Social workers have come to see that their most immediate problems concern those who permanently sever their connection with the schools at an early age, and many are beginning to feel that a complete solution of these problems is to be found only by beginning earlier than the post-school period; that is, that

school reform must be made the basis of the particular kind of social reform in which the social workers are primarily interested. They point out that immigration and the ineffective education of thousands of native-born children are swelling the ranks of the unemployed or the irregularly employed, and they insist that there is lack of real economy in refusing a more appropriate education to those who are bound to become wage earners in their early teens.

The following quotations are indicative of the opinions and attitude of the officials of reformatories and prisons, as well as of philanthropic social workers, regarding the need of industrial training.

"Industrial training, by engaging convicts in some useful industry, is the only way to make them obedient and tractable while in prison, and industrious and useful members of society when they are released. It is necessary that trades should be taught and practiced in the same manner as they are practiced in the world, that the education and trade training should fit men, when they come out, to support themselves in the way the world requires, as among the causes of crime the proximate one is very often the lack of ability for self-support. . . ."

"In many penal institutions labor is the essential element in the reform training of the individual, and through it he becomes accustomed to the habits of industry, proficient in the use of tools, and is made to feel that he has ability within himself for the earning of an honest livelihood. The plan that is being used in some institutions, of allowing prisoners to look forward to the certainty of being employed upon a better grade of work as the reward of industry, acquired proficiency, and good conduct, is certain to lead to results of greatest benefit to the prisoner, the institution, and the state. The prisoner's ambition and interest are aroused, and he is encouraged to pursue a course which should end in his acquiring a useful trade. Society at large is benefited by

anything that tends to better the condition of the prisoner in the way of improving his opportunities of earning an honest livelihood after his release."

"The importance of imparting to prisoners the complete knowledge of a trade, as it lies in the minds of those most competent to form and pronounce an opinion, may be inferred from the fact that, with absolute unanimity, prison officers declare it to be their judgment that the reformation of the prisoner would be promoted by giving greater prominence to this object; and they further declare it as their opinion that reformation genuine and permanent, whatever the first cost of it may be, is in the long run the cheapest and most profitable and will prove the greatest ultimate pecuniary gain to the state." [1]

"In our judgment the greatest good that can be accomplished in our reformatory institutions lies in a more thorough course in the school of letters, in military drill, and in manual-training and trades schools, not altogether because they give us a people more handy and practical for domestic life and better skilled in trades, but because they will give us citizens with an entirely different intellectual basis."

"Shop work systematically carried out engenders a habit of industry and observation that cannot be acquired in any other way. It gives to the inmate a knowledge of the difference between accuracy and vagueness, and an insight into the complexity of everyday life, which, once wrought into the mind, remains there as a lifelong possession. Work in the shop will confer upon the inmate precision; for under a competent instructor he must do the work that is laid out, definitely right or definitely wrong."

"Hence we believe that the greatest results from a scientific standpoint in the reformation of delinquents, and the greatest

[1] From the Report of the United States Industrial Commission on Prison Labor, 1900, Vol. III. The date is significant. The educational movement did not take definite shape before 1905 or 1906.

good that can come to the younger generation, will be the establishing of more practical institutions of learning, known as manual-training and trades schools, where practical instruction of everyday life can be had. More practice and less theory is the need of the hour."[1]

"I am inclined to the opinion that so far as bettering the condition of the boys who come under the care of this institution is concerned, an extension of the shop work and trades would be better than a larger farm, for the reason that very few of them will follow farming after they pass out of the school [Iowa Boys' Industrial School]. Ninety per cent of the boys come from towns and cities, and they will go back to their homes and follow some trade or avocation which will permit them to live in a town or city. They do not take as kindly to farming while in school as they do to the shops."[2]

"The trade schools of the Philadelphia House of Refuge have reached the point of affording for the larger boys useful and skillful labor which enables them to readily get mechanical employment after they leave the house, at satisfactory wages; their knowledge of the use of tools makes them independent, and they perform most of the mechanical work about the buildings. . . ."

The Illinois Manual Training Farm School does not receive the worst delinquents, but rather those bordering on that stage. So successful do they believe their division of work between school and farm and shops to be, that the president of the board, Mr. Butler, expresses himself thus: "The work in the school is now made almost as interesting as the work in the shops. Possibly some day the public schools of Chicago will divide their school hours as we now divide ours at Glenwood, one half of the time being given to books and the other half to work in the shops."

[1] W. H. Whittaker, Jeffersonville, Indiana, National Prison Association, 1906.
[2] Report of the Iowa Board of Control, 1903, p. 710.

Again, speaking of the material with which they have to deal: "The boy in the city whose mechanical genius makes it possible for him to teach his fellows how to pick a lock, is just the material needed for our manual-training school. After he has worked for a week in the machine shop of this building he will look upon lock picking as something beneath his notice. . . . This boy is not bad. He is just a boy, and because he is a boy he must have something to do."

Without waiting for reform within the schools, social workers have secured the establishment of association schools and classes, and the introduction of industrial work into prisons and reform schools, as the surest way of creating a better social and moral life.

One of the early philanthropic institutions established to give especial attention to industrial education was the North Bennet Street Industrial School of Boston. For many years it has conducted classes, both in connection with and independent of the public schools, which have been of great value to those who were studying the problem of the education of the masses. During the past four years the director, Mr. Alvin E. Dodd, in coöperation with the public-school authorities, has worked out in detail a most interesting and successful course of study for grades seven and eight. Perhaps no school in the country, either public or private, has done more to demonstrate the possibility of making the last two years of the elementary school vocationally valuable to the boys and girls who go early into industrial occupations.

Among the best industrial schools in the East are those conducted by the Y.M.C.A. It is worthy of note that these schools frequently receive in tuition from the pupils a sum equal to that expended by the association for salaries of instructors. This would seem to indicate a demand on the part of the workmen themselves.

Instruction is given in these classes in every conceivable branch of industrial work, and educators have many lessons to learn from these efforts.

One of America's first citizens once said that if one wished to attend the best schools in the country he must be an Indian or a negro. While this statement is extravagant, all must admit the remarkable and illuminating results, both educational and social, achieved by the Hampton Normal and Agricultural Institute of Virginia and the Tuskegee Normal and Industrial Institute of Alabama, to which this remark referred.

The above instances exemplify a demand for industrial education, a demand made by men and women who have no special interest in industry or in educational institutions as such, but who urge this training as a cure for the social evils following in the wake of unemployed ignorance. Perhaps social workers have been clearer in their vision of the end to be accomplished than educators, and their demands have been freer from prejudice and criticism than those of capital and labor. There is, in the following quotation from the social worker, guidance for the manufacturers, the labor unions, and the educators if they will but take its broad lesson seriously to heart.

"In promoting public industrial education the social worker must devote himself in a painstaking way to the sympathetic study of the point of view of organized workmen as well as of progressive employers with regard to the matter. The trade-unionist's objection that the labor market is always in danger of being flooded is not to be ignored. In any case the decision as to the direction in which pupils shall be trained must be made in full knowledge of the labor market. The skilled journeyman's contention that there must, in any case, be a period of special shop apprenticeship is perfectly sound and holds just as surely for the craft of the mechanic or artisan as for that of the doctor or lawyer. On the other hand, the trade-unionist must be

led to see that the trade school is simply another sort of machine, which, though from a short-range point of view threatening to the workmen's wage standard, in the long run can only enhance the interest of all concerned by stimulating both production and consumption through raising the whole standard of intelligence and capacity. It is inconceivable that, as a class, school-trained workmen would not be even more jealous than others of all unreasonable encroachments upon their wage standard, and that they should not apply their additional training to the development of even more effective forms of labor organization than now exist. In any movement for the development of industrial education, workingmen should not only be consulted, but should be represented in the administration as experts in many of the important detailed matters affecting the progress of such instruction. The truth is that industrial education is coming. Those who do not put themselves in line to reap its advantages may even have some of its force turned against them." [1]

As Mr. Woods affirms, industrial education is coming, and from out the turmoil of conflicting demands the social factor is gradually emerging, and it is the only factor on which all can be brought together in essential unity of purpose. It is becoming clear that children must be fitted for the industries to the satisfaction of reasonable employers, but they must be so fitted that their entry into the industries will be made as happily as possible, and with the hope and prospect of advancement and of ultimate success.

This will be done, not by overriding the opinions of labor unions regarding the labor market on one hand, or, on the other, by refusing to give training to children except on labor's terms, but by securing the coöperation of labor in the radical improvement of educational facilities and thus in the betterment of industrial conditions for all.

[1] Robert A. Woods, Charities, Vol. XIX, p. 844.

The advancement of the compulsory school age, when it comes, will be accompanied by such an enlargement of opportunities within the school that every child will be materially benefited by the added time devoted to school work.

While this modification of the public schools will result in especial benefit to the future industrial worker, it will be made without in the least affecting the opportunities now afforded for the most liberal education.

In all educational work there will be even greater reliance on the teachings of psychology, but these teachings will be interpreted into terms of method and organization by *social* as well as by individual psychology.

All this can be effected only by modifying some of our traditional educational ideals, and these modifications will be discussed in the following chapter.

CHAPTER VII

THE REVISION OF EDUCATIONAL IDEALS INVOLVED IN THE MOVEMENT FOR INDUSTRIAL TRAINING

In the foregoing chapters we attempted to analyze what seemed to be an almost universal demand for industrial education, and found that it could be attributed to four rather distinct causes: the desire of manufacturers to secure more efficient workmen without increasing the cost of production; the desire of organized workmen to prevent the flooding of the labor market with cheap and partially trained labor, and, at the same time, to secure for themselves and their children an education enabling them to resist exploitation; the desire of the educators to develop a larger percentage of the children intrusted to the care of the schools to a point more nearly commensurate with their several native and peculiar abilities; and the desire of organized society, working for social betterment, to eliminate one of the most potent causes of crime and unhappiness, namely unemployed ignorance.

Each of the forces has attempted to remedy, in its own peculiar way, the evil which it has detected. Manufacturers have conducted schools of their own, and they have attempted to secure municipal, state, and national legislation for the establishment and maintenance of public industrial schools. Labor organizations, partly as a countermove, have likewise sought to influence legislation, and they have also established schools under their auspices. Educators have sought to provide an adequate training for all pupils by enriching the curriculum and by organizing schools which apparently differ widely from the established types. Philanthropic and charitable societies have

inaugurated countless clubs, classes, and schools for providing one or another form of manual or industrial work, and have secured its introduction into penal institutions, reformatories, homes, and hospitals.

All of these forces, working together or working separately, have brought about during the last generation a radical change in educational ideals. Great as these changes have been, there is reason to believe that still greater modifications are immediately before us, and that, when thrown into their proper perspective, these changes will be seen to be in direct line with educational reform since the Middle Ages. The doctrines of Rabelais, Bacon, Montaigne, Locke, Pestalozzi, and Froebel, interpreted by the demands of Luther, Comenius, and Horace Mann for universal education, and forced into prominence by the existing economic conditions of to-day, show that the present movement was natural and inevitable.

Our new ideal requires, first of all, a more accurate adjustment of education to individual needs and opportunities.

Those who were formerly looked upon as the natural and the sole rulers have been forced, by the growing consciousness of the masses of mankind, to yield something of their power. They have come by necessity to acquire an interest in and respect for the "artificers and workmasters." More, they must have accurate knowledge of them, — their labors, aspirations, and problems. This indicates the bed rock of the newest ideal of education, — the recognition by the few, of the needs and the rights of the many in matters of education as well as in politics and religion. That the power should be yielded somewhat reluctantly is only to be expected.

Since our new ideal will require adjustment to individual needs, a careful study of the conditions of children, both in school and in industry, must be made. Much, it is true, has already been done in the way of investigation, but it is astonishing to see how

slightly the information has as yet affected action. As the result of investigations begun nearly a decade since, the attention of educators generally has been called to the fact that approximately 85 per cent of the children entering the public schools of the United States, leave between the ages of twelve and fifteen, and that a large number of these have not completed the elementary-school course.

Not only is this true in the cities with their large foreign population, but it is also the case in rural districts, peculiarly so with the boys. Dr. Andrew S. Draper, commissioner of education for the state of New York, states that "there is a larger percentage of illiterate children of native-born than of foreign-born parents in the state of New York." Five years ago this waste by leakage from our schools was prominently brought to our attention, yet surprisingly little has been done to stop it by any other method than to offer more diversified courses in high schools.

High schools, however, no matter how diversified the courses offered may be, so long as they require the completion of the grammar-school course as a condition of entrance, obviously cannot reach or greatly influence the majority of the boys and girls who refuse or who are unable to finish the elementary-school work.

Our revised ideal will thus involve a shifting of emphasis from secondary to elementary education.

Ex-President Roosevelt says: "The exceptional individual, of the highest culture and most efficient training possible, is an important asset for the state. He should be encouraged and his development promoted, but this should not be done at the expense of the other individuals who can do their work best on the farm and in the workshop; it is for the benefit of these individuals that our school system should be primarily shaped."

This, of course, does not mean any lessening of our interest in the higher education, but merely that the education given in

the first eight grades shall not be planned as if it were *simply* preparatory for the high school. It must be planned *mainly* for those who will fill the *ranks* of the industrial army.

America is the land of promise and should undoubtedly continue to foster the idea that there is "room at the top"; but it is time that we thought seriously about the educational rights of those who must fall short of the top, — who, perhaps, must stay near the bottom. Our scheme of education is planned for the few rather than the many. It is a selective process, and the machinery and methods are adapted to those who "go to the top."

If children began school at the age of six and progressed regularly from grade to grade, compulsory school attendance till the fourteenth birthday would assure to all the completion of the elementary-school course. This is not, however, the case; and in cities where statistics are available, the figures show that the greatest loss of children from the school is in passing from the fifth to the sixth, or the sixth to the seventh grade, and that large numbers of children, on leaving school at fourteen years, have not passed beyond the fourth grade.

Our new ideal would thus seem to require a careful revision of the elementary school: first, to secure a more reasonable progression from grade to grade by all, through the right kind of work, teachers, and conditions; and second, to provide an education that will make it worth while for all to remain in school a little longer, and one which not only *is* worth while, but one which will appeal to the children and their parents as being so.

The present form of the elementary school has come down to us from the time when the home and the farm provided the children with ample opportunity for vocational experience, through concrete, creative work under natural conditions. Our reorganized elementary school will seek to substitute other conditions, just as real, which will provide for the actual participation of the children in productive activity. The traditional manual training

attempted to do this, but failed, so far as the awakening of industrial interest is concerned, because it substituted artificial needs for real ones, and then sought to administer to those needs through tool work, which was generally unrelated and often inappropriate.

Our revised ideal will require the adoption of a more flexible school organization, — one which will provide for an earlier differentiation than is now afforded by the division into elementary schools of eight, and secondary schools of four, years. It will require that differentiation be made possible at the sixth or seventh grade, or when the child is twelve or thirteen years old.

It is frequently contended that this is too early in life for a boy to decide for himself, or for his parents to decide for him, that he will enter upon an industrial course or a commercial course, but the fact remains that the majority of our boys and girls are deciding at about this age to leave school altogether and go to work. Would they not run less risk of making a mistake were they to select one of the vocational schools established, or to be established, for children of elementary grade?

This earlier differentiation, by the way, is now possible in some cities for boys who are going to college. Such are admitted to the preparatory school at the sixth grade. This is because those who usually make courses of study and decide questions of school organization are college men. As such they appreciate the value of an appropriate training for the college courses, and insist on it, even though the boy must omit the study of music, drawing, design, and manual training. May it not be equally advisable for the boy who is to have an education for industrial life, to have an early preparation in drawing, applied geometry, design, and constructive work, even though he must omit some of the more formal work of our traditional courses, as, for example, technical grammar and demonstrative geometry? Differentiation at the sixth grade will give both of the above types an equal opportunity.

While the need of remodeling the elementary school is the greatest, our new ideal will require new and varying high or secondary schools, or differentiated departments in existing high schools. These new secondary schools or departments will be intensively vocational in purpose, and it is expressly intended that they shall *not* lead to higher schools excepting those which are also distinctly vocational, but shall lead directly to business and industry.

Educators are being warned not to train boys away from the farm and the shop. This the schools have undoubtedly done to some extent. Our revised ideal will require that we educate the boy for work on the farm and in the shop, but that we shall so educate him that he will make a better farmer and will develop a richer farm life, or will demand a better shop and conditions more favorable to progress and to a reasonable enjoyment of his work and his leisure.

The whole tendency of industrial development during the past two hundred years has been to concentrate in the hands of fewer and fewer men the *management* and *direction* of industry, until, while the theoretical possibility of rising out of the ranks to be a captain of industry still exists for each individual, the probability that a considerable number will do so is remote, and for the vast majority we must admit that it is an absolute impossibility.

The problem then is to provide such an education as will make clear to this majority the meaning and the joy of work and of study. The time devoted to education in the elementary and secondary schools is too short to impart all necessary knowledge, but it may not be too short to develop the desire for knowledge and skill, and the habits of study and of industry.

How can this be accomplished? The purpose of the lower schools has been and must remain broadly cultural. The revised ideal will set the task of ascertaining what part vocational activities — agricultural, commercial, and industrial — can contribute

to this culture, by making the vocational work central, and by grouping around it and articulating with it the book or study work, thus providing a new incentive to study and a new meaning to knowledge and art.

The direction and management of the schools will also need modification. Instead of insisting that educational results obtained in these schools be measured only by traditional educational standards and methods, our revised ideal will require that the vocational schools submit their product to the tests applied by business and industry. The schools will therefore accept the assistance and the advice of business men and manufacturers; they will *not*, however, turn over the management, and especially the instruction, to commercial interests, but will clearly recognize the need and value of coöperating with them. The *advisory committee* will play an important part in the development of the new schools.

Another ideal which will require revision is that regarding the qualification of the teachers of industrial subjects. When manual training was first introduced into the public-school system, the demand for teachers was much greater than the supply. There were many mechanics, young men of good habits, with a common-school education or more, and a liberal training in some particular trade. These men, however, were not desired as teachers. At first it might appear that they were passed by because of their lack of professional pedagogical training. This cannot have been the case, for, at the same time, men who had merely a traditional college education were given positions to teach academic subjects in high schools although they also lacked the teacher's professional training. Neither had any knowledge of educational psychology, or of the practices which those principles had demonstrated to be effective in the teaching of children. Experience would indicate that college graduates show no more willingness or ability to follow these teachings

than do the instructors in industrial and commercial branches, who have succeeded, in spite of restrictions, in gaining entrance to the educational profession.

The fact is, that educational authorities very early set up scholastic requirements for the teachers of the new subjects. Before a man could teach machine-shop work in a high school he had to pass an examination in English and American literature, algebra, demonstrative geometry, a foreign language, etc., etc. The result was that in time the work fell into the hands of men who were trained in the traditional school subjects rather than in the practical work which they were to teach. They knew a foreign language, imperfectly, but they knew little or nothing of the universal language, drawing. They knew demonstrative geometry, but little descriptive or applied geometry. They knew something of algebra, but they never, by any possible chance, made use of it in the shop, and were, of course, entirely unfamiliar with shop formulæ. To-day the manual-training work generally is condemned by the "public," the manufacturers, and the labor leaders, as being absolutely useless as industrial training, and the teachers as being incapable of conducting or of understanding the purpose of real industrial schools. While much of the criticism is unjust the lesson is evident. Our revised ideal will permit us to employ as teachers men and women who have intelligence equal to that of the ordinary teacher, and a general education which enables them to handle effectively the ordinary means of expression, oral, written, and graphic; a liberal education, including experience, in their specialty; and a working knowledge of the principles and practices of teaching.

Our revised ideal will require constant opportunity for varied, hopeful, and extensive experimentation, with inspiration drawn not from the traditions of the past but from the needs of real children who are preparing for the struggle with present-day

conditions. Investigations we have had in abundance,— investigations of conditions on this and the other side of the water. Experiments are *much* more necessary to-day. One example is more fruitful than a thousand arguments.

Several worthy examples have already been set by individual schools or school systems, and some of the more instructive of these will be described or noted in later chapters. In this connection, however, may be mentioned the action of the New York State Education Department, which invites such experimentation.

In a syllabus issued in the summer of 1910 the department recommended that a six-year elementary course be put into effect the following September. The following statement was made:

> In determining the work of the elementary schools a six-year course has been prepared. The course is general in character and adapted to *all* children until that period of their development when they manifest different interests, mental powers, and tastes, which is usually at the age of twelve.
>
> This six-year course is followed by an intermediate course of two years, covering the usual seventh and eighth grades and rounding out the elementary course. In this two-year course the work begins to differentiate. Work is planned which leads to the long-established high-school courses, to commercial courses, and to industrial courses. Certain work previously done in the high-school course has been brought down into this two-year course to economize the pupils' time, to reduce the pressure and strain under which high-school students have labored during their first years in high schools, and to interest pupils in work which will induce them to remain in school for a greater number of years.

The new ideal will require the schools to coöperate both with the parent and with the employer in assisting the child or youth at that most important and trying time in his life when he passes from the school to the more exacting responsibilities and the longer hours of work. Formerly the boy entered into the new experiences of his industrial life with his hand, so to speak, in the hand of his father. This transition is now commonly made by the boy alone. It is, furthermore, far more difficult now than then, because it is a transition from *all* school and play to *all*

work,— from a perfectly familiar environment to one that is completely unknown. The public, represented by the school, should be intensely interested in the boy or the girl at this critical period, and should retain a reasonable responsibility for his control and guidance.

To summarize:

Our ideal will secure a more accurate adjustment of educational facilities to individual needs and capacities.

It will require the centering of interest on the education of the 85 per cent of our children, with the consequent enlargement of our regard for the elementary school.

It will demand greater flexibility and more definite purpose in courses of study and school organization.

It will show the wisdom of a complete differentiation of purpose at an earlier age than is now commonly possible.

It will demand a new type of secondary school.

It will demand that our inspiration be drawn from the study of existing conditions, and that we discover, by experimentation, and *emphasize* the culture which is to be derived from common work well done.

It will admit to the teaching force men and women who are thoroughly competent to give the needed instruction, and who have an accurate and practical knowledge of, and an interest in, the particular vocation for which the school or class is training its pupils.

It will compel us to seek the coöperation of all interested in the child's welfare,— parent, teacher, and employer,— to the end that he may make a successful and happy entry into his vocational life.

Finally, this revision of ideals does not require that we relinquish aught of the high purpose which has always dominated American educational institutions,— the desire to promote broad culture, a sensitiveness to the refining influences of all that is

best in literature, art, science, technology, life, in so far as our experiences bring us into contact with these influences. It does not mean that we should reduce our effort to provide for the few the very closest and most complete contact with any or all of these influences. It does not ask that we overlook or minimize the immense value, to the many, of this liberal education of the few, but may it not be true that the most important service education can render the country at the present time is to teach workers to work, *but* to work in such a way and with such a comprehension of what work means, with such a knowledge of the conditions under which work is commonly done, and with such an appreciation of the value and purpose of leisure, that the very work may be made the means of culture to the worker, bringing to him something of the development which work brought to the worker when craftsmanship was at its best and the work became art and the worker an artist?

In whatever part of the large field his main interests may lie, no student of education who has clear sight can fail to recognize the fundamental importance of the proposition to utilize, in the education of an industrial people, the cultural value of work.

CHAPTER VIII

A PLAN FOR IMMEDIATE REORGANIZATION

Complete and adequate reorganization of public-school systems in accordance with new ideals will require time and wise experimentation, and concrete examples will furnish the most convincing arguments. At the same time much benefit may result from the formulation of comprehensive plans based on the present organization of our schools, but made large enough to include the education of all the children in a given community. It is the purpose of this chapter to outline a tentative plan suitable for the schools of urban and especially of industrial communities. Only the most prominent and general characteristics can be given, as it is fundamentally important that all details be determined by *local* conditions.

In the first place the plan must eliminate all preventable retardation in the grades. Already progress in this direction has been made by the somewhat common establishment of classes for mental defectives, of disciplinary classes for those who are especially unruly, and of ungraded classes for those who are temporarily under grade in some studies. But it will require measures more inclusive and far-reaching than these to secure the reasonable development of each individual in the first six grades. Among possible improvements are smaller classes, shorter terms and more frequent promotions, and the grading of the pupil in each subject or in groups of subjects, thus securing his progress where progress is possible, even if he fails to advance in one or another study. Throughout this period there should be possible a wide variety in methods of instruction to suit individual

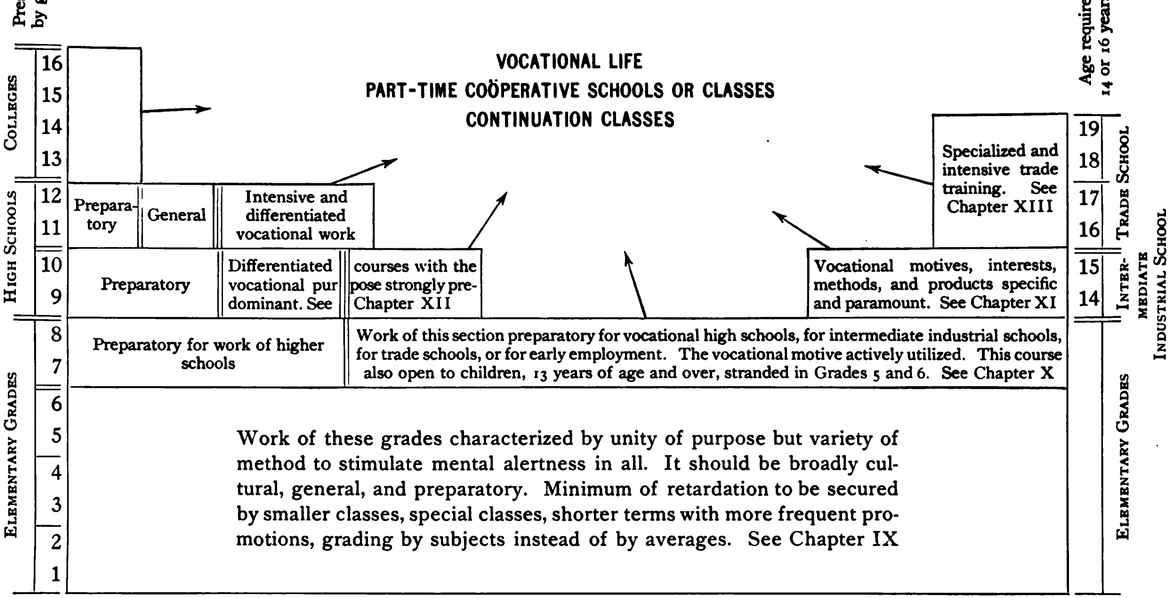
characteristics, but an absolute unity of purpose; namely, to give each pupil an opportunity of developing in every possible direction. The added expense of such a plan is admitted, but it is reasonable to believe that it would be more economical than the present wasteful arrangement, which admittedly fails with 50 per cent of the pupils in the public schools. At the end of the sixth grade, and at intervals thereafter, provision should be made for differentiation of *purpose* as well as of method. How minutely the school work must be subdivided it is impossible to say, but it is apparent that it must follow the tendency of the times toward specialization, and, furthermore, that there are four points at which this differentiation of purpose will be most effective. These are at the close of the sixth and eighth grades of the elementary school, and of the second and fourth years of the present high-school period.

Let us examine briefly the opportunities which should be offered at each of these points.

At the close of the sixth year those children who are *definitely planning* to leave school at the end of the eighth grade or earlier should be *permitted* but not *forced* to enter upon a course of study arranged with that fact clearly in mind. This course should be strongly influenced by the local vocational possibilities open to children at an early age. It is sometimes designated as "prevocational." It should aim not primarily to fit the children for these positions, which are probably undesirable, but to give them such an understanding of the conditions as would induce them to remain longer in school whenever possible. Failing this, the child is better able to cope with the unfortunate conditions and to work through them to something better. It should be noted that this course serves a double purpose, — to deter those who would, and to assist those who must, leave school at fourteen or fifteen years. The course should have the further purpose of impressing the pupils with the value of trade-school training

PLAN NEEDED UNDER PRESENT SCHOOL ORGANIZATION AND CLASSIFICATION

Double vertical lines indicate opportunity for differentiation of purpose. Triple vertical lines indicate barriers which are set up by earlier differentiation and which cannot readily be crossed



and of interesting them in continuation-school opportunities, either day or evening, where such exist. There is a possibility that the early worker may become a permanent student, a thing strongly to be desired.

While these pupils have entered upon the differentiated seventh-grade course with the idea of terminating their studies at the end of the eighth grade, possibility of changing their plans and of continuing their school work beyond this point should not be closed to them. The possibilities offered on completing the eighth grade should be entrance to a trade school or to a vocational course in the high school. Pupils should *not* expect to enter upon the classical high-school course with the same chances of success as those who did not differentiate their work at the seventh grade.

Let us now examine the paths open to the pupils planning to go beyond the eighth grade.

All such would continue through grades seven and eight with effective preparation for the high school. Arriving at the first year of the high school the ways divide again very much the same as in grade seven. Those planning to remain two years or less may elect a specific vocational course, at the end of which they may (1) go to work, (2) decide to continue with intensive vocational work in the high school for one or two additional years, or (3) enter the trade school, to which later reference will be made.

The remainder of the pupils, those expecting to graduate from the high school, whether they enter college or not, have a choice between several high-school courses, — classical, commercial, agricultural, or technical (including domestic science and art).

Finally, those who decide at the beginning of the third year of the high school to terminate their studies on graduation will have open to them not only the college preparatory course and the general high-school course, but optional intensive vocational

courses. They should not expect to enter on existing college courses from the vocational classes.

A qualifying statement should be made, and the importance of this fact is great. At the place of branching, some of the subjects of instruction may easily be common to the curricula of both or of all branches made at that point. This will serve both a social and an educational end, since it reduces segregation to the minimum and removes something of the irrevocability of the decision.

We have examined the plan as to its horizontal stratification. A clearer meaning of its import may be gained from considering one or more of its vertical divisions.

At the foundation, and common to all divisions, lies a six years' training of the most scientific and modern character, with every possible effort devoted to meeting the needs of each individual *educationally*, in the literal meaning of the word. Here no thought of economic efficiency need enter to modify any method shown to be successful in awakening real interest and intellectual effort on the part of the children. No retarded child should be considered stupid or lazy simply because he is "different" from the imaginary average. In fact, he should not be retarded but should be subjected to such stimuli as will excite his interest and impel effort. It is probable that few children will be found wholly unresponsive to the various methods which modern educational science has demonstrated to be effective.

From this point the pupils may be divided into four rather distinct groups: (1) those going to college; (2) those planning to complete the high-school course; (3) those planning to take only the two-year vocational course in the high school; (4) those expecting to terminate their schooling at the end of the elementary course.

Let us examine the main subdivisions of the most extensive and liberal training, namely, that terminating in the professional

schools. This may be divided horizontally between (1) a period devoted to broad general training, corresponding to the elementary grades and the first two years of the high school; (2) a shorter period, devoted to laying the groundwork of the specialty, which corresponds to the later high-school and the early college years, in which electives enable a student to select the group of subjects which will be the best foundation for any given profession, as, for example, the selection of history, language, political science, etc., for prospective students in the law school; and (3) the intensive and relatively narrow specialization in the chosen profession. This last period is believed to be of prime importance for the professional man. It is practically impossible for any considerable number to secure satisfactory entrance to the professions without it.

The plan which we have outlined will make it possible to give to the students in all of the four divisions something analogous to this complete training for the professions. Here the time element must be taken into account. After it is learned *what amount of time* the student has at his disposal it should then be proportionately divided between these three general subdivisions found to be so essential to the professional man: first, the broad general training; second, a preparation in the group of studies which will form the best groundwork for his specialty; third, a brief period of intensive specialization which will prepare him for a successful entry upon his chosen vocation.

The fact cannot be too strongly emphasized that entry upon a vocation without special training of some kind is becoming more and more difficult, and the attempt to make such an entry without this special training, and without guidance and advice, is attended with difficulties and grave dangers which the schools have too long ignored.

While it is believed that the plan outlined would be broad enough, if adequately carried out, to embrace the two following

types of schools, it is certain that under present conditions there is a demand for the intermediate industrial school and for the trade school.

Until retardation has been effectually prevented or greatly reduced, there is need of courses similar to the differentiated seventh- and eighth-grade courses, but open to any boy or girl thirteen years of age or over who is in or below the sixth grade. These are sometimes called separate or intermediate industrial schools.

In addition, it is probable that another type is needed, and this might be called a trade school. There are few public trade schools in the country, but they fill a distinct place. Trade schools should be open to boys and girls of sixteen years of age, should emphasize the development of skill, and should lead very directly to some particular trade.

In certain localities part-time coöperative courses are the most effective means of giving a thorough industrial training. As mentioned in a former chapter, they have their peculiar advantages and disadvantages, but they should be promoted wherever conditions are favorable both to the cause of labor and the cause of education.

Continuation schools, both day and evening, are also to be desired, the former for apprentices and the latter for adults.

These in no way affect our plan except that they furnish at all points another educational opportunity for those entering upon their industrial life. *They do not obviate the necessity for any part of the complete scheme.*

Finally, it is not expected that the child will be left to find his own way in the maze which this plan spreads out before him. Vocational guidance is a concomitant of vocational education. By a skillful combination of the wisdom, interest, and experience of the parent, teacher, and employer it is possible to base such guidance upon principles approaching a science.

This involves, first, the giving of imformation about vocations in general and about the particular opportunities for work in the immediate vicinity, and also about the opportunities afforded by the several schools for giving adequate training for these positions. This will be based on information carefully selected and collated and made available for intelligent use. Such information might be so arranged as to show at a glance just what was involved in the preparation for a given vocation in terms of years, money, and effort, and what characteristics were needed in the individual for success therein.

Next comes assistance in placing the pupil when the transition from school to work must be made. At this time he needs to be shown the advisability of taking a position suited to his tastes and his peculiar qualifications, and one which offers an opportunity for advancement, even though at the outset it may not be so attractive as some other which pays a larger initial wage.

And finally, the young worker should receive sympathetic supervision and counseling subsequent to his entry into his new work. This is a most trying time for many a boy and girl, and should be given most careful attention.

There is need for specially trained assistants in all this work.

It will almost certainly be contended by some that all this involves the formation of plans by parents and children at a much earlier age than is possible or desirable. It should be noted that this is merely an opinion, and that there is little or no available material either to refute or to substantiate it. A preliminary investigation is now being made which may throw some light on the question. As this book goes to press the returns have not been so thoroughly studied as to warrant a definite statement, but the plan of investigation and the impressions received from information thus far available may be of interest.

The following letter and questions have been submitted to schools in Denver, Colorado; Springfield, Illinois; Cincinnati and Youngstown, Ohio; Indianapolis, Indiana; Dandridge, Tennessee; and Chicago, Illinois.

(Sent to superintendents or school principals)

THE UNIVERSITY
OF CHICAGO

Dear Sir:

We are making an investigation, the purpose of which is to determine whether any considerable number of parents have formed definite plans for the future education of their children by the time the child has reached his thirteenth year, and, further, to learn whether parents are willing to divulge such plans and to coöperate with the schools in selecting the best studies consistent with them.

The schools have very generally proceeded on the assumption that these facts could not be ascertained in enough cases to warrant any differentiation in courses of study based on such information. Even if the investigation does nothing more than to confirm this belief, it will be worth the making, but it is hoped that something much more positive will result.

[Signed] ____________________

(Blank given to teachers for distribution)

QUESTIONS TO BE ASKED OF PARENTS OF ALL CHILDREN BETWEEN TWELVE AND THIRTEEN YEARS OF AGE

1. How much longer are you planning to send your $\left\{\begin{matrix}\text{son}\\ \text{daughter}\end{matrix}\right\}$ to school?
(Mark answer with an ×.)

Till $\left\{\begin{matrix}\text{he}\\ \text{she}\end{matrix}\right\}$ is fourteen years of age.

Till $\left\{\begin{matrix}\text{he}\\ \text{she}\end{matrix}\right\}$ is sixteen years of age.

Till $\left\{\begin{matrix}\text{he}\\ \text{she}\end{matrix}\right\}$ completes the course in the elementary school.

Till $\left\{\begin{matrix}\text{he}\\ \text{she}\end{matrix}\right\}$ completes the course in the high school.

Other classifications. ____________________

____

2. If the boy or girl is to leave school at fourteen, what work do you expect that he or she will take up?

QUESTIONS TO BE ASKED OF TEACHERS

1. If not clearly indicated above, is the child reported on this blank a boy or a girl? ____________________
2. What will be the age of the child in September, 1911? ____________
3. If not withdrawn from school, when would you expect the child to graduate from the elementary school? Indicate below.

1912 {February / June} 1913 {February / June} 1914 {February / June} 1915 {February / June}

It is quite evident that the results of this preliminary investigation cannot be taken as conclusive, but they seem to furnish some evidence that parents are willing to coöperate with the school authorities in the important matter of adapting education to *time limitations* where such limitations exist.

In fact it appears to the author that this willingness to coöperate is more marked on the part of the parents than it is in the case of the typical school principal. The chief obstacle to the investigation seems to have been the attitude of the principals. They say, "We are not much interested in vocational education in our school," or "How can a boy of thirteen know what he wants to do?" or "Parents do not know what they *will* do regarding the education of their children, and they would not tell you if they did." Others feel that "the parents are incapable of filling out the blanks intelligently." Nevertheless one principal, in a predominantly foreign district, secured fairly trustworthy replies in essentially every case. He was able to demonstrate the fact that 25 per cent of his twelve- to thirteen-year-old pupils were to receive but two more years of schooling.

From an examination of the returns it appears that a considerable number of parents are willing to state, when the child is between twelve and thirteen years of age, that his schooling is to terminate at fourteen, or as soon as the law permits. It is, of course, entirely possible that some of these parents may

reconsider the question and keep the child in school for one or two years more, but this very desirable decision will be reached more frequently when the schools make some concessions to the needs of the early workers.

It is believed that one or more of the features of the plan outlined in this chapter will be found effective in meeting the needs of pupils of this type.

An examination of the chart (p. 65) will show graphically the several features of the plan, and the descriptions of the various schools and classes given in the following chapters are illustrative of one or another of these features. It will be seen that taken together they form as complete a plan as the one here outlined. While no city in the country has yet evolved such a complete system, it will be seen that it is perfectly feasible to do so, since each feature of it has been put into successful operation somewhere.

It is felt that a study of these several examples of industrial education will furnish the strongest arguments in their favor.

It is the author's intent, therefore, to give, in the remaining chapters, descriptions and brief historical sketches of typical schools and to interpret the nature and purpose of the instruction given in them. In most instances he has personally visited and studied the schools described, although liberal use has been made of the published statements of those directly responsible for their management.

No attempt has been made to include all the existing examples of industrial education, though it is believed that no conspicuous instance of an original and important contribution by a public school has been omitted.

Bulletin No. 11 of the National Society for the Promotion of Industrial Education gives a descriptive list of trade and industrial schools in the United States. While this list is more complete than the one given herewith, it omits, as not falling within

the scope of the work of the society, several experiments which the author believes lie at the very foundation of the larger conception of the movement for vocational education. These experiments are classified as "prevocational," and, as the term indicates, they deal with the period preceding that in which a real vocational training is possible or desirable. As such schools furnish a suitable foundation for vocational education, and especially as they succeed in interesting in such education pupils who would otherwise be lost to the school system altogether, their vocational significance is not to be questioned. It is therefore believed that they may very properly be included in this study of industrial schools. Some of these experiments are described in Chapter X.

CHAPTER IX

EXAMPLES OF MORE FUNDAMENTAL REORGANIZATION

In the preceding chapter a plan was proposed for meeting the immediate needs of the present generation of school children without modifying, in any radical way, the prevailing systems of school organization. Everything suggested therein might be put into operation and still leave untouched the common division into elementary and secondary schools of eight and four years respectively, and the present practice of grading on averages and of advancing the pupils by yearly or semiannual promotions based on such grading.

It is not to be doubted, however, that widespread dissatisfaction exists among educators with what are seen to be purely artificial distinctions and inconsequential practices. More clearly formulated *purposes* are determining the selection of subject matter, the adoption of methods of instruction, and particularly the formulation of plans of grading and promotion. In all parts of the country this dissatisfaction is indicated by the thoughtful experiments which are being inaugurated in school management. In the following pages a few of these experiments are briefly described.

It has been recognized that retardation lies very near the source of those peculiar educational ills which it is the purpose of industrial training, especially that proposed for the elementary grades, to cure.

All efforts to reduce preventable retardation are worthy of careful study. Wherever "special classes," so called, classes for mental defectives or delinquents, or ungraded classes of any

description, are organized, this desirable end is brought nearer realization. These classes, however, are so commonly found in school systems to-day that no detailed mention of them need be made.

The methods of grading and the plans of promotion briefly described below are suggestive of still further progress in this direction. No attempt is made to treat the subject exhaustively or chronologically, but merely to emphasize the fact that the educational opportunity of the industrial worker can be advanced quite as effectively by saving "two wasted years" *before* fourteen as by devising special schools and methods for caring for retarded children between fourteen and sixteen years of age.

The grading system has been quite generally based on the supposition that a certain amount of school work should be accomplished in a definite period, and the *unit* of time has commonly been one year. Under this system the pupil who is "retarded" usually, albeit with numerous individual exceptions, repeats the entire year's work.

While in many cities promotions are now made semiannually, and elements of flexibility are being introduced into school grading generally, it is probably within the facts to consider yearly promotions to be the plan which commonly obtains in the United States.

Cambridge, Massachusetts

The well-known "Cambridge Experiment" has been in operation in that city for nearly twenty years. It permits pupils of varying abilities to pass through the "grammar" school by one or another of four different ways, requiring from four to six years respectively. This is done without "skipping" a grade or receiving "double promotion."

This is accomplished by arranging three courses of study, A, B, and C, planned to cover the total amount of work normally

done in the last six years of the elementary school, in four, five, or six years respectively, by conducting classes along each course and by providing for transfers from one to another at intermediate points. This plan has not only resulted in reducing the percentage of pupils who take more than the allotted time to complete the elementary-school course, but also in enabling a considerable number to do the entire work of the school with a saving of one or even two years from the normal six.

St. Louis, Missouri

In St. Louis the school year is divided into four quarters, each quarter being ten weeks in length. Where the schools are sufficiently large it is possible to have a class corresponding to each quarter. By this arrangement contiguous classes are rarely more than ten weeks apart, and frequently are less. At the end of each quarter the pupils are graded, receiving marks of Excellent, Good, Moderate, Conditioned, or Failed.

A pupil who continuously receives the highest grade, "Excellent," is usually given the opportunity of attempting the work of the class immediately in advance, making up such work as may be necessary.

A pupil who receives the grade "Failed" repeats the work of the quarter with the class immediately below the one in which he failed. Even if he is unable to recover the ground thus lost, he has added but ten weeks to the time required to complete the course.

Class promotions are made four times a year, and the comparatively short intervals between classes permit individual promotions at any time.

The plan has been in operation for many years, and is believed to be instrumental in lessening the amount of repetition in passage through the grades. This opinion seems to be sustained by Dr. Ayres's estimate ("Laggards in Our Schools," p. 87)

that the average number of years for completing the eight grades in St. Louis is 8.98, thus placing this city well toward the head of the list of the twenty-nine cities investigated.

Portland, Oregon

Another city which stands well up in the above-mentioned list is Portland, Oregon. Regarding grading and promotions in the schools of that city Mr. Frank Rigler, city superintendent of schools, in his report for 1910, says:

In the earliest schools teaching was addressed to individuals, not classes. Each pupil recited in his turn from his own book. It soon became clear to teachers that time might be saved by teaching a group of several pupils together. This was the beginning of classification, and out of this simple arrangement developed all the systems of classification now in existence. But while class teaching began as a matter of economy of time, it was soon found to possess other points of advantage over individual teaching. Its chief superiority is due to the fact that new ideas find different attachments in different minds, because of differences in antecedent experience. This causes a different point of view for each pupil in the class, hence the attrition and liveliness of a well-conducted class recitation.

In the formation of classes in a modern school several things must be considered, first among them the size of the class. It has been said by an innovator that one teacher may instruct a class of eighty or one hundred just as easily as a smaller number, because a presentation good for one is good for all within the sound of the teacher's voice. The fallacy of this view is apparent when we reflect that it is not only the teacher's duty to present her subject to a class, but also to note the effect of such presentation upon each individual in her presence. No teacher can perform this latter function if she has to address one hundred pupils. Those who can perform it with a class of forty pupils are comparatively few. Those who can notice the effect of teaching upon twenty are many times more numerous. Perhaps somewhere between fifteen and twenty-five is the ideal number to be engaged in any recitation, and this leads to the conclusion that in the modern elementary schoolroom there should be two classes, one of which is studying while the other is reciting. Besides having the right number engaged in a recitation, an ideal classification would require that their attainments and their powers be exactly equal. It is not possible, of course, to obtain this ideal classification, but when instruction addressed to the class seems

trivial to the top, or unintelligible to those at the bottom, the classification is bad and ought to be changed. Practical classification, in what are accounted good schools of the present day, lies somewhere between these two extremes. The fact that the classification is not ideal requires it to be supplemented by individual teaching. It is noticed by the alert teacher that the assignment, study, and recitation of a lesson have not produced the desired effect upon certain pupils of the class. Therefore such efforts must be supplemented by individual work. While it has always been the practice in most schools to recognize this function of individual teaching, yet in some parts of the country, notably Batavia, New York, there has been, within the past decade, a revival of interest and emphasis upon this very important matter. Other things being equal, it is desirable that a class organization, when once formed, should remain fixed for a considerable period of time. The fact that only equality of attainments is considered when making up classes tends to defeat this desirable end, for that part of the class having the greater mental power draws rapidly away from the other part. So whether there be a formal division or not, there must be a practical division made by the teacher, by addressing one part of the instruction to the upper half of the class, and the other part to the lower half. In fact, I have heard teachers themselves classified as teachers of leaders and teachers of trailers, according to the proportion of the time that they devoted to the two groups into which an ordinary class tends to divide.

The Portland system of classification prevents this disintegration of classes by taking into consideration power as well as attainment when classes are formed.

The course of study is divided into fifty-four parts, numbered continuously from one to fifty-four. The time is divided into terms of five months each, promotions taking place regularly at the end of each term. Three terms, or one and one-half years, constitute what we for convenience call a cycle. Classes are permitted to progress at whatever rate is found suitable to their powers, but the two standard rates are three parts per term for second divisions and four parts per term for first divisions.

The normal class interval at the beginning of a cycle is three parts of the course of study, measured not in time but in work. In large schools the class interval is often only two parts of the course, sometimes in the lower classes only one part of the course.

At the beginning of each cycle any group of pupils who have reached the same point in the course of study is separated into a first and second division. By the end of the first term the first divisions will have passed over four parts of the course of study, and the second divisions over only three. By the end of the second term the first divisions will have passed

over eight parts of the course of study, and the second divisions over only six. At the end of the third term the first divisions will have advanced twelve parts, and the second divisions only nine. It will be seen now that each first division has overtaken the second division next above it. In the new cycle these two divisions are united and again divided. In this redivision some of the pupils that did first-division work during the preceding cycle are put into a second division, and some who did second-division work are put into a first division.

While the normal cycle is a period of three terms, and while most of the overtaking and redividing is done at the end of these cycles, nevertheless in large schools where the interval between some of the classes is only two parts of the course, the second divisions are overtaken in two terms. On the other hand, in smaller schools, the class interval is sometimes four parts of the course of study, and the cycle is extended to four terms. At the close of each term, occasionally during the course of a term, there is some overtaking and redividing to be done. I am of the opinion that in a thirty-room building the class interval for the first ten rooms could be made one part, for the next fifteen rooms two parts, and for the highest five rooms three parts, of the course.

In every schoolroom there are two divisions progressing at different rates. Where the more advanced is a first division the classes are said to be diverging, that is, the interval between them is "increasing." Early in the cycle this is the condition in most schoolrooms, but in the third term of the cycle we try, as far as possible, to have first divisions roomed with second divisions which are in advance of them. Such classes are said to be "converging," that is, the interval between them is diminishing.

In the exigencies of rooming it is sometimes necessary to make up a "division" by taking the stronger members of a first division and classing them with the weaker ones of a second division, who are one or one and one-half parts in advance of them. In such cases the division commences its work at the point already reached by its stronger members. The interval of one or one and one-half parts can thus be passed over very rapidly, being review for the weak ones and new work for very strong pupils.

Such emergency divisions, however, do not usually continue more than a term. By that time the strong pupils have outstripped the weak and they are then classed with the strongest members of the same second divisions whose weaker members they have just passed, their place being taken by the middle section of the same division.

An important feature of our system of classification is promotion by subjects instead of by "averages." A pupil may do first-division work in one subject and second-division work in another. Sometimes he will

have to recite part of his work in one room and part in another, but no inconvenience need result from this. In fact, it is an advantage in rooming, as we can make his headquarters in the less crowded of the two rooms.

This system of classification and promotion was introduced into the schools of Portland in 1897, and has been in operation continuously since that time. Before its introduction we used the orthodox eight-grade system with semiannual promotion. If a pupil wished to go faster than the eight-year rate, he might take a term's work with one class and the review work with the next higher class. Thus in a term of five months, he did work that was intended for a year. It will be noted, however, that the rate at which the higher term's work was done, under these conditions, was five times as fast as the ordinary rate of pupils; and if it were kept up continuously, a pupil would finish the eight grades of the elementary schools in one and three-fifths years. The result of such a system was that very few pupils ever did more than the normal quantity of work, and those who did were found subsequently to be deficient in the ground passed over with such unwarranted rapidity. Then again, there was no way in which a pupil could take a lower rate than the orthodox one, without failing and repeating the work of a term.

If I understand the plan pursued at Cambridge, Massachusetts, and one recently mentioned by Dr. Edison under the head of plus classes, the rate of speed for first classes or first divisions is one and one-half times that of the slower classes or second divisions. If this rate were continued throughout the course, it would cause the first division to complete the work of the elementary schools in five and one-third years, the slower ones doing it in the orthodox eight years. Now, under the Portland plan, a pupil who does first-division work during his entire life in the elementary school will be prepared for high-school work in seven years. A pupil who does second-division work all the time will require nine years to complete the elementary course. We find that perhaps a third of the pupils require this time, and they get it with us, not by failing once or twice and repeating some particular part of the course, but by doing somewhat less work each term for the entire nine years. Our first division proceeds one and one-third times as rapidly as our second division, or one and one-eighth times as rapidly as the normal class in the orthodox eight-grade system.

Fully half of our pupils are able to maintain this rate throughout the course, without detriment to their health and without much home study. A considerable number do part first-division and part second-division work, and thus complete the elementary course in seven and one-half, eight, or eight and one-half years.

Menomonie, Wisconsin

In Menomonie the system of grading, from the fifth grade through the high school, is not vitally related to the plan of promotion.

Pupils are graded every six weeks and *in each subject*, the "grade" indicating the position of the pupil with relation to the class average in that subject. If the pupil falls a certain percentage below the class average, successively, in a subject, he is required to take the work in that subject with the next lower section. Such a pupil may carry the work of the grade from which he has just fallen, if he is able to do so, and may be reinstated at the end of the six weeks, provided he can reach the required standing in the subject. The superintendent, Mr. George A. Works, states that a considerable proportion of the pupils recover their grade during the six weeks' trial period.

The plan gives an equal opportunity to the able pupil to carry additional work in the class just in advance. It is obvious that this plan requires a departmental system, and would therefore be of questionable expediency for earlier grades.

Cleveland, Ohio

Beginning with the summer of 1911, the entire school system of Cleveland was reorganized on a quarterly plan of four terms of approximately three months each, there being only a brief vacation between the quarters.

While this reorganization involves many educational questions, it is of interest in this connection because the schools were open, during the first summer quarter, only to pupils who were below grade. There were about ten thousand such pupils in the city, about five thousand of whom enrolled for the summer quarter. This, therefore, may properly be considered another plan for reducing retardation.

Chicago, Illinois

Experiments intended to reduce the amount of retardation in both the elementary and the high school were inaugurated in the Chicago public schools in the summer of 1911.

There were administered in connection with three of the vacation schools, although in a measure independently of them, what were styled "Review Schools." Classes were formed for Grades 5, 6, 7, and 8, and were open to children recommended by principals of the elementary schools.

To be eligible for membership in these classes a child must have failed of promotion the preceding year, but also must have shown some ability to recover his grade by the extra work of the summer session. The measure of success was to be determined by an examination given by the principal of the elementary school on the return of the children in September.

Three such review schools were in session for six weeks of the summer vacation, on four mornings a week from nine till twelve o'clock.

Wendell Phillips High School

Summer high-school classes, for pupils who had failed in one or more studies during the preceding year, were organized in the Wendell Phillips High School.

The classes received two lessons a day in each subject, with a study hour between, and were thus enabled, with ten recitations a week, to cover in five weeks the work of a quarter, or what amounted to a complete review of a semester's work.

No pupil was permitted to enter the school for the purpose of doing advanced work.

Partly as an experiment, and partly because of financial conditions, a tuition fee of ten dollars was charged each pupil. This fact is thought to have some bearing on the measure of success

attending the venture. Two hundred and ten pupils were registered in these classes and 89 per cent passed in one or more subjects.

The tuition fee practically covered all expenses.

It is expected that the review schools will become an integral part of the Chicago school system.

Berkeley, California

The plan of organization described below has been in operation in the Berkeley schools for two years with marked and salutary effect on the retention of pupils.

The units of the school system are three in number instead of the conventional two. The first, the elementary school, comprises the first six years; the second, the lower high school, the seventh, eighth, and ninth years; and the third, the upper high school, the tenth, eleventh, and twelfth years.

While satisfactory completion of the work of the first or second unit confers eligibility for the next higher grade, the main emphasis is not placed on *preparation* with the higher school as a goal. Instead, the work of each unit is based on the assumption that *all* the children *might* leave school at the end of that particular cycle of work. Mr. Frank F. Bunker, superintendent of city schools, says that he is willing to contend that such a plan results "not only in the best possible preparation for those who drop out, but likewise the best possible preparation for those who go on from grade to grade, finally entering the university."

In a report to the Board of Education recommending the adoption of the plan, Mr. Bunker said:

> An examination of this plan will convince one, I think, that the division of the grades into three groups is a much more natural one than the arrangement under which we are now working, with a division of the grades into two groups only.
>
> Statistics show that the masses are held in school no longer than through the fifth grade, and that at the close of the fifth grade they drop out in very

large numbers, which means, educationally, that whatever is to be taught to the masses must be given in the first five or six years.

In the schools comprising this group of the first six years I would have the course of study uniform for all children and somewhat narrow in its scope. I would see to it that emphasis is placed on those things which the masses must have if they are to get on at all. I would see to it, whether or not anything else were got, that at least the children learn how to read, how to write, how to use their own language, both orally and in written form, how to perform with facility and accuracy the simple operations of arithmetic and of accounting, and I would also see to it that in these first six years they get somewhat of a sympathetic knowledge of their city; state, and national government, and that they also learn the elementary things about sanitation and health conditions which everybody needs to know, not only to protect themselves as individuals, but to protect society as well. I would select from the corps for work in these first six years, teachers who are particularly adapted to handling children of this early age and to inculcating the content which I have just outlined.

In the "introductory high schools" there would be congregated the seventh, eighth, and ninth years. These years comprise another natural group, inasmuch as children would enter it at the beginning of the period of adolescence, when by nature they naturally crave an opportunity to dip into a wide range of subjects and activities, which is Nature's way of insuring a freedom of choice in determining occupation, and somewhat of intelligence in the same. I would have certain prescribed subjects for this group, but in addition thereto would permit as many electives as possible, thus making it unnecessary, as at present, for every child in the seventh and eighth grades to take exactly the same work as every other child. In contrast to the work of the first six years, I should wish to see the work of this group made exceedingly rich in content and variety, and particularly in human interest. I should hope to see the work of this group relate very closely to life and be as far away as possible from that which is purely academic in education. I should wish much emphasis placed on learning how to study, how to use the library, how to get material from the same with expedition and with judgment. If a child foresees that he wants to take German or Latin in the high school proper, I would wish him to begin these languages when he enters this group and thus have six years of work in the same before he enters college instead of four, according to our present arrangement. I should wish to see the work of this group shaped up to make a more easy transition from the work of the elementary grades to the departmental work of the high school. In line with this I should wish teachers assigned to work in these grades who have a broad culture and wide experience in teaching in the grades.

By an arrangement of this kind it would seem that the work of the high school proper could be made more intensive than it is at the present time, with higher standards of scholarship and more rigid requirements than at present obtain, and without working any hardship upon the young people who enter the same; for it would seem that if this work which I have outlined be carefully and efficiently done, that the incoming student will have developed a much more serious attitude toward his work than obtains at the present time, will have oriented himself better, so far as his subjects are concerned, and that the break will not be so great or so discouraging as with the plan under which we are now working.

It is evident that the crucial point of this unique organization is to be found in the lower high school, and the plan commends itself for the reason that this period of school life coincides very closely with that period of youth which is, perhaps, the most difficult for the teacher to understand, and, therefore, the one where the pupils suffer most from misdirected effort on their own part and also on the part of their teachers. In this system of schools the major purpose of the intermediate unit is one of adjustment.

Among other opportunities offered in this "trying-out" period is the possibility of selecting studies which appeal to the awakening vocational interests of some of the pupils. Thus far the vocational subjects offered have been commercial rather than industrial, but in such a community as Berkeley this is perhaps all that could reasonably be expected in the second year of such an important transition.

Concord, New Hampshire

The reorganized school system of Concord consists of three units or groups, which are numbered in the reverse order of the grades or years in school.

Group 3, the elementary group, comprises the first six grades; Group 2, the lower of the secondary groups, comprises the seventh and eighth years; and Group 1, the ninth, tenth, and eleventh years, or the high school proper.

The plan is thus similar to that of Berkeley, with the important difference that, by the Concord plan, an attempt is made to save a year's time. It is believed that this is made possible by eliminating reduplication, which so frequently obtains in the last elementary and the first high-school year of the traditional school system.

As carried out, the plan actually provides greater opportunity for differentiation than is found in Berkeley, as will be seen by referring to the course of study for 1911–1912 (see pp. 88–90).

In commenting on the plan Mr. Rundlett, superintendent of schools, says:

"Through the first six years of this course the studies remain practically uniform for all pupils, the main idea being to teach them how to read, to write, to use the mother tongue properly, the essentials of history and geography, how to take care of their bodies and to live in cleanliness and purity,— in short, those things which all people should know in order to make the best use of their lives. Upon completing the work of Group 3 the student may take up the work outlined for Group 2, making his choice of approved high-school courses or pursuing still farther what are commonly called the three R's.

This change comes at a time in the pupil's life when he seeks variety. If he forecasts a college course, he may have five years of study instead of four. If he wishes a more practical course, he may choose a commercial or a mechanic arts course. In these grades emphasis will be placed upon teaching the pupil to become self-reliant, how to study as well as how to recite, and to get material for his work with dispatch and with good judgment. He will be introduced to departmental teaching, handled by teachers who make a study of individual natures, and have the approval of the state department as being qualified for the work, thus securing the benefit of teaching backed by broad culture and by individual grade experience.

In the high school proper, Group 1, advantage will be manifest in a decreased enrollment, so that the general atmosphere will be relieved of the confusion of numbers.

Eventually more rigid requirements and better standards of scholarship should result, because entering pupils will have had two years of serious preparation along lines of high-school work.

This scheme is combined with semiannual promotion throughout the entire course."

HIGH SCHOOL — GROUP 1

			COURSE I. CLASSICAL AND ENGLISH	COURSE II. COMMERCIAL	COURSE III. MECHANIC ARTS
FIFTH YEAR	11	V	English 4 United States History and Civics 4 *Choose Three* Latin 5 Greek 5 French 5 German 5 Review Mathematics 4 Advanced Mathematics 4 Chemistry 5	English 4 United States History and Civics 4 Bookkeeping (one half year) } Banking (one half year) } 4 Economics (one half year) } Commercial Law (one half year) } 4 *Choose One* French 5 Chemistry 5 Stenography 4 Typewriting (4) 2	English 4 United States History and Civics 4 Chemistry 5 Free-hand Drawing (girls) } Mechanical Drawing (boys) } (4) 2 Mach. Shop Practice, Adv. Mech. (boys) } Household Economy, Sewing (girls) } (8) 4 *Choose One* French 5 Review Mathematics 4
		U	"	"	"
FOURTH YEAR	10	T	English 5 *Choose Three* Latin 5 Greek 5 French 5 German 5 Physics 5 English History 5	English 5 Bookkeeping 5 *Choose Two* French 5 Physics 5 Stenography 4 Typewriting (4) 2	English 5 Physics 5 Mechanical Drawing (boys) } Free-hand Drawing (girls) } (4) 2 Mach. Shop Practice, Ele. Mch. (boys) } Household Economy, Sewing (girls) } (8) 4 *Choose One* French 5 English History 5
		S	"	"	"
THIRD YEAR	9	R	English 5 Geometry 5 *Choose Two* Latin 5 Greek 5 French 5 Medieval and Modern History 5 Biology 5	English 5 Geometry 5 Commercial Arithmetic (one half year) } Bookkeeping (one half year) } 5 *Choose One* French 5 Medieval and Modern History 5	English 5 Geometry 5 Mechanical Drawing (boys) } Free-hand Drawing (girls) } (4) 2 Pat. Making, Forging, F'dry Prac. (boys) } Domestic Science, Sewing (girls) } (8) 4 *Choose One* French 5 Medieval and Modern History 5 Biology 5
		Q	"	"	"

HIGH SCHOOL — GROUP 2

SECOND YEAR	8	P	English Myers's First Year Mathematics Ancient History *Choose One* Latin French	5 5 5 5 5	English Myers's First Year Mathematics Commercial History Commercial Geography Penmanship (2)	5 5 5 4 1	English Myers's First Year Mathematics Ancient History Mechanical Drawing (boys) } (4) Free-hand Drawing (girls) } Adv. Woodwork'g, Cab. Mak'g, Turn'g (b.) } (8) Domestic Science, Sewing (girls) }	5 5 5 2 4
		O	"		"		"	
FIRST YEAR	7	N	English Literature Arithmetic and Algebra Latin United States History	5 5 5 5	English Literature Arithmetic and Algebra English Grammar and Composition United States History Penmanship (2) Manual Training } Cooking, Sewing }	5 5 5 5 1 3	English Literature Arithmetic and Algebra English Grammar and Composition United States History Penmanship Elementary Cabinet Work (boys) } Sewing, Cooking (girls) }	5 5 5 5 2 3
		M	English Literature Arithmetic English Grammar and Composition United States History Manual Training } (4) Cooking and Sewing }	5 5 5 5 2	English Literature Arithmetic English Grammar and Composition United States History Penmanship (2) Manual Training } (4) Cooking, Sewing }	5 5 5 5 1 2	English Literature Arithmetic English Grammar United States History Penmanship (2) Manual Training (boys) } (4) Sewing, Cooking (girls) }	5 5 5 5 1 2

Military drill is required twice a week of all the boys in Group 1.
Music may be elected one period a week in any course in Group 1. It is required in all other groups.
Drawing may be elected two periods a week in Courses I and II.
Manual training and domestic science may be elected two periods a week in addition to work in Courses I and II.
All electives are subject to arrangement of program.
The arrangement of studies in courses is designed to assist students in choosing their subjects so that each may follow out some definite line of work.
Students who intend to enter college should decide before entering Class N.
Students are expected to take the full work of one course, beginning with class N, and thus secure a diploma.
To secure promotion to class N 10 points are required; to class O, 20 points; to class P, 30; to class Q, 40; to class R, 50; to class S, 60; to class T, 70; to class U, 80; to class V, 90; to graduate, 100 points.
The numerals following subjects in the courses show the number of weekly recitations and the value in points of each study.

ELEMENTARY SCHOOLS — GROUP 3

			READING	SPELLING	ARITHMETIC	LANGUAGE	HISTORY	GEOGRAPHY	HYGIENE	PENMANSHIP
Sixth Year	6	L	"	"	"	"	"	"	"	"
		K	"	"	"	"	"	"	"	"
Fifth Year	5	J	"	"	"	"	"	"	"	"
		I	"	"	"	"	"	"	"	"
Fourth Year	4	H	"	"	"	"	"	"	"	"
		G	"	"	"	"	"	"	"	"
Third Year	3	F	"	"	"	"	"	"	"	"
		E	"	"	"	"	"	"	"	"
Second Year	2	D	"	"	"	*	"	*	"	"
		C	"	"	"	*	"	*	"	"
First Year	1	B	"	*	"	*	"	*	"	"
		A	"	*	*	*	"	*	"	"

KINDERGARTEN — ELECTIVE

Manual Training. Woodwork, classes K and L for boys. Sewing classes I, J, K, L for girls.
Music and Drawing. All classes throughout the entire course.
Ethics and Nature Study. One period a week of fifteen minutes in *all* classes to K.
Physical Exercises. Throughout the entire course.
No pupil below the age of five years can enter Class A.
The age of pupils for kindergartens is from four to six years.
Parents are urged to continue children in the kindergarten until the age of six years, because those pupils entering Class A at five years of age are usually retarded a year on account of immaturity.
Parents are also urged to continue their children in school through Class L, rather than send them to work before completing the elementary-school course.
* Shows that the subject is not taken in this group.

Promotions. The class letters of *each group* represent nineteen weeks of school work. At the end of this time promotion to the succeeding class occurs. The figures indicate the years of school work. The years *written* at the head of each year's course indicate the number of the year in each group. It is often desirable for pupils to repeat class work of nineteen weeks, and parents are urged to coöperate with the teachers whenever this repetition seems necessary.

GARY, INDIANA

While most educational reforms are brought about gradually by numerous and relatively slight modifications of existing systems, it sometimes happens that an educational institution is so situated that it can depart radically from the traditional and can organize its work to meet its own conditions without reference to precedent. Such a school would be difficult to "classify," but would, nevertheless, richly repay careful study.

The Emerson School of Gary is such an institution. It has much that is pertinent to every phase of our subject, and, in fact, might appropriately be mentioned in most of the succeeding chapters as illustrative of the several types described therein. Perhaps in no particular is it more noteworthy than in the provisions which it makes for securing reasonable and continuous progress of its pupils from the first grade through the entire school. In fact this seems to be the central thought of its unique system.

Partly because of the impossibility of considering the school or its work along vocational lines, under the classifications which we have made, a description of it cannot here be given. The student of education is referred, however, to a popular article in *Hampton's Magazine* for July, 1911, entitled "Keeping the Children in School." [1]

Perhaps one cannot wholly agree with the enthusiastic writer of the article, that the Emerson School "is the educational center of the United States, the public school of the future," or that "there is not a city in the United States where the Gary system could not be applied"; and one must entirely disagree with certain criticisms of procedures supposed to obtain in "average" schools, but a sympathetic reading will convince

[1] A subsequent report of the school, written by Dr. John F. Bobbitt, appeared in *The Elementary School Teacher* (The University of Chicago Press), for February, 1912.

the most conventional and conservative that here is an unusually suggestive example of popular democratic education.

The author has studied the Emerson School and is inclined to think that, in respect to its coöperation with manufacturers and labor unions, and to its great economy of effort, of space, and especially of the children's time, it is one of the most remarkable and interesting schools which he has ever visited.

Mr. William A. Wirt, superintendent of the Gary schools, says:

> The school program is so arranged that during each morning and each afternoon session of the school one half the pupils have ninety minutes of work in the regular subjects,— English, history, and mathematics,— followed by ninety minutes of work in the special subjects,— manual training, science, drawing, music, play, and physical culture. The remaining pupils have the same program but in reverse order, the regular work following the ninety minutes of special work. Thus work in both regular and special subjects is being carried on continuously during the day, by special teachers and on the departmental plan, as far as desired, in either group.
>
> A child, if it is for his best interest to do so, may take an extra amount of regular work in place of a portion of the special work, or vice versa. Thus a boy who has failed in English can make up his deficiency by going into another regular English class during his special-work period. A boy whose interests demand that he be given more time in manual training can have a maximum of three hours a day in that subject, if desirable, during the regular school hours.
>
> The regular sessions are from 8.30 A.M. to 12 M. and from 1 to 4 P.M. The library, playgrounds, gymnasia, swimming pools, shops, and laboratories are open for two hours additional time during the five school days and for eight hours on Saturday. Thus pupils may supplement the work of these departments with extra work out of regular hours. The school plant is also open from 7.30 to 9.30 P.M. for continuation-school and social and recreational activities. Day-school pupils, by special permission, may supplement the day-school work by evening work.

A leaflet printed in the school reads as follows:

> Reduce the first cost of your school plants and the actual per-pupil cost of school maintenance by adding manual training, nature study, music, drawing, playground and gymnasium equipment, and specially trained

teachers for each of these departments. By adding these departments with specially trained teachers you can also relieve permanently and completely the overcrowded school program and curriculum, and the overburdened teacher and pupil. It all depends upon *how* you do it.

The following program shows how the number of pupils in an ordinary eight-room school has been doubled, and the number of pupils per teacher and supervisor has been increased.

Regular School		Forenoon		Afternoon	
Teachers	Rooms	90 Min.	90 Min.	90 Min.	90 Min.
First Grade	Classroom	1a	1b	1a	1b
Second Grade . . .	Classroom	2a	2b	2a	2b
Third Grade	Classroom	3a	3b	3a	3b
Fourth Grade . . .	Classroom	4a	4b	4a	4b
Fifth Grade	Classroom	5a	5b	5a	5b
Sixth Grade	Classroom	6a	6b	6a	6b
Seventh Grade . . .	Classroom	7a	7b	7a	7b
Eighth Grade . . .	Classroom	8a	8b	8a	8b

Special School									
Teachers	Rooms	45 Min.	45 Min.	45 Min.	45 Min.	45 Min.	45 Min.	45 Min.	45 Min.
Music	Auditorium	1b	2b	1a	2a	3b	4b	3a	4a
Drawing and M. T. .	Basement	3b	4b	3a	4a	1b	2b	1a	2a
Literature	Library	5b	6b	5a	6a	7b	8b	7a	8a
Nature Study . . .	Basement	7b	8b	7a	8a	5b	6b	5a	6a
Three Physical- Culture Teachers and the Building Principal	Attic	2b	1b	2a	1a	6b	5b	6a	5a
	Attic	4b	3b	4a	3a	8b	7b	8a	7a
	Playground	6b	5b	6a	5a	2b	1b	4a	3a
	Playground	8b	7b	8a	7a	4b	3b	2a	1a

For the sake of clearness the improved school machine is represented as two schools, a regular school and a special school. The special school occupies what was formerly waste space in this building. Eight teachers are in the regular school, and eight teachers, including the building principal, are in the special school. Sixteen schoolrooms are accommodated in an ordinary eight-room school building. Including the school principal and the special supervisors, only one teacher per schoolroom is employed.

Under the old program there were sixteen classes in this building, but each class was only half schoolroom size and each teacher had two classes in a

room at the same time. Under the new program the number of classes remains the same, but each teacher has only one class in a schoolroom at any period and the classes are full schoolroom size. The new program is used successfully in four-room schools, eight-room schools, groups of portable schools, and thirty-room school buildings constructed especially for the new system.

The physical-culture teachers keep the playground open during the noon hour, an hour after school, and from 9 A.M. to 5 P.M. on Saturdays.

The foregoing instances of attempts to modify the fundamental organization of school systems and to introduce elements of flexibility affecting the whole scheme of education are undoubtedly indications of a deep-seated dissatisfaction with traditional educational motives and standards. They reveal as well a determination, on the part of educators, to remodel the public schools from within.

Meanwhile advancement has been made in other localities by developing new schools and classes without affecting, immediately and directly, the system as a whole. These new educational "experiments" are generally confined to a limited field and their purpose is clearly defined. Generally speaking they have been brought out by forces outside the educational field, or, at all events, at the suggestion of those who are not of the teaching profession, and they are expected to benefit primarily those who have profited least by the prevailing types of schools.

It is the purpose of the succeeding five chapters to classify, describe, and interpret some of these examples.

CHAPTER X

PREVOCATIONAL WORK IN GRADES 6-8

The schools described in this chapter have been conducted with the purpose of improving the courses of study in the elementary school, especially for those children who have not worked successfully under the prevailing methods found therein.

It will be noted that these new courses of study are not intended to deprive boys and girls of further education in the higher schools, but that they aim to save for this education a much larger percentage of the school population, while at the same time giving information about, and practice in, some industrial work.

Too much emphasis cannot be placed on the necessity for appreciating this *double purpose* of prevocational work. The word "vocational" serves in one case to describe the "end" of the education given, and in the other to indicate the "interest" which is utilized as a force impelling to an even higher end.

The Agassiz School Industrial Classes, Boston, Massachusetts

This was the first of the existing experiments in industrial training established within the elementary schools of Boston, and, it is believed, the first of this type in the country, having been organized in September, 1907.

The primary purpose in establishing the classes was to provide an experiment, the results of which would assist in answering one or all of the following questions:

(1) Is it possible so to modify the elementary-school curriculum that it will become more effective in training pupils for industrial

pursuits, while maintaining the same efficiency in preparation for high schools?

(2) Will a considerable number of boys and their parents be interested in such a course of study, should it be established?

(3) If taken by boys otherwise likely to leave school at fourteen years of age, will this course have the effect of inducing them to stay longer in school?

(4) Will the pupils be as interested in manufacturing a product which is to be used by the city as in making for themselves the ordinary manual-training models?

It was for the purpose of gaining some practical experience relating to these questions that the school committee on May 6, 1907, passed the following order, namely:

That the superintendent be authorized to designate one or more boys, elementary schools in which the course of study may be experimentally modified for the purpose of determining in what way these schools may become more effective in training pupils for industrial pursuits, while at the same time maintaining their efficiency in preparation for high schools.

In accordance therewith the superintendent selected the Agassiz School, Jamaica Plain.

About a week before the close of the school, copies of the following circular were distributed among the boys who were to be in Grade 6 during the coming year.

Agassiz School, Jamaica Plain, Mass., June, 1907.

An opportunity will be offered, next September, to fifty boys of Grade 6 in the Agassiz district, to enter a class in which the course of study is planned especially for boys who have an aptitude for industrial pursuits.

The course will offer more manual training, shop arithmetic, and working drawing, and at the same time will maintain the efficiency of preparation for high schools.

If you wish your boy to join this class, please sign the following blank form and return it to the master of the school.

As the number who can be accommodated in this course is limited, the earliest applications will be considered first.

Nearly one third of all the boys eligible for the class applied within one week, and in the following September a sixth-grade class of fifty boys was organized.

The class was divided into two sections of twenty-five boys each, and each section worked one hour of each school day.

In determining the nature of the work to be done, and in selecting the articles to be made, one fundamental principle served as index and guide. Everything must conform as closely as possible to actual industrial work in real life. It was decided that the product must be not only useful, but must be needed and must be put to actual use; that it must be something which may be produced in quantities; that the method must be practical, and both product and method must, so far as possible, be subjected to the same commercial tests, as apply in actual industry.

For two years these boys had done the regular manual-training work of Grades 4 and 5,—cardboard construction,—so it was decided to begin the industrial work with box making.

It was found that pasteboard boxes, costing three quarters of a cent each, were being used by the school department in sending out certain supplies, and the class undertook the manufacture of several hundred of these boxes.

The method employed was as follows: First a sample box was studied and careful note was taken of its use, of the material of which it was made, and of the details of its construction. Especial attention was called to the dimensions and to the need of obtaining accurate results in order that all boxes might serve the purposes for which they were intended and also be alike.

Each boy then made one entire box, drawing, cutting, scoring, gluing, staying corners, pasting.

Next, by a brief talk and with necessary demonstration, an explanation was given of the greater economy of employing "industrial methods."

Jigs were made for facilitating some of the operations and for securing greater uniformity in the product. The class was organized into different groups of from two to six boys each, each group performing one of the several operations involved in the making of the box or the cover. There were the box cutters, cover cutters, stayers, pasters, fitters, and gluers. There were those who assembled, inspected, packed, and counted the boxes, and there were the assistant teachers,— foremen in embryo.

Of course this was not all done in one lesson. By the time seven hundred and fifty of these boxes were made and packed, ready for the supply team, the boys had gained at least a glimmer of light on five points of superiority of this the industrial method over the method first employed: first, that there was greater economy in the use of material; second, that much time was saved, since it was not necessary to lay aside one tool and hunt for another at the completion of a single operation; third, that the skill increased very rapidly by performing the same operation many times; fourth, that a standard of accomplishment in a given time was established, below which no self-respecting boy wished to fall; fifth, that a "good" box could not be produced if any of the group of boys did "bad" work.

In passing I must note and answer one objection which some advocates of "educational" manual training will make, namely, that frequent repetition of the same movement is not educational, since it becomes practically automatic,— a matter of the spinal cord. Be that as it may, the boys show an ever-increasing interest and delight in their work as they become more and more skillful, for there is a keen joy in mere accomplishment which is by no means a matter of the spinal cord, but of an intelligence which is much higher. It should also be noted in this connection that from time to time the groups were changed, so that in the end all the boys had performed several, if not all, of the different operations.

The second project was a box smaller and more finely constructed than the first. Sixteen hundred of these were made.

In speaking of the methods used in making the later projects it is only necessary to note two points in which they differed from those first employed: First, in the earlier project the groups were chosen with reference to the ability of individual boys and the difficulty of the several operations; in the later, the groups were formed by taking the boys in order, and by appointing a foreman for each group.

Second, a system of "check" was introduced, which made it possible to trace poor work to its author, thus fixing responsibility. After the completion of the second project some calculations were made to ascertain the increase of efficiency, and it was found to be about 400 per cent.

Each year since 1907 approximately 33 per cent of the boys of the sixth grade of the Agassiz School have requested permission to enter the industrial class, and each year more than the average number of boys have been regularly promoted, so that since September, 1909, there have been three grades, 6, 7, and 8, included in the experiment.

It is to be observed that during the four years fewer boys have left school at the age of fourteen than would ordinarily be expected in this district; that the boys have done all of the regular work of the school excepting manual training, which the industrial work supersedes; and that interest has been maintained, though the product has been a practical one manufactured in quantity and used by the school department.

The so-called industrial work consists of the making of articles from heavy pasteboard and other box materials, as illustrated by the first projects described above, and also of woodworking and drawing, free-hand and mechanical.

Briefly outlined by grades, the work, or product, of the initial class during its three years was as follows:

Grade 6. During this year the following articles were made by the boys:

850 pasteboard chalk boxes for the supply department.
1750 pasteboard crayon boxes for use in elementary schools.
500 pasteboard pencil boxes, cloth covered, for use in high schools.
710 Harvard covers for use in high schools.
846 wooden sand shovels for use in summer playgrounds.

A portion of the time was given to mechanical drawing, which consisted of simple geometrical problems and the working drawings of the projects to be made.

Grade 7. In this year there were made:

34 portfolios for use in the evening industrial school.
333 boards for modeling classes.
266 wooden looms, 266 heddles, and 522 shuttles for use in the sixth-grade weaving of the elementary schools.
100 wooden specimen boxes for use in the normal school.
36 work boxes.
6 wooden cases for the evening industrial school (begun).

A limited amount of time was given to the making of working drawings of the different projects.

Grade 8. The work of this grade has been as follows:

Completion of the 6 cases above noted.
100 boards for use in modeling classes.
4 window ventilators.
24 wooden trays for cardboard-construction equipment.
100 wooden bench hooks for the supply department.
1000 wooden bench stops for the supply department.
600 specimen blocks for the Agassiz School.
2400 card-catalogue boxes for the school department (begun).

In this grade less time was given to construction work and more to drawing. The boys were taught the more accurate use of drawing instruments, and made carefully finished working drawings. During the last half of the year the boys made a catalogue of the work of the industrial classes. This catalogue included mechanical and free-hand drawings of all the articles made. It also included such designing of the cover and spacing of the pages as would make the catalogue attractive. By this method attention was called to the practical use of mechanical drawing, free-hand drawing, color, and design.

Only a few facts and some incomplete statistics regarding the work of the boys of this initial class, subsequent to graduation from the elementary school, are available.

While these boys selected the course because they were industrially inclined, 38 stayed to graduate. Of these, 24 entered high school, 6 went into mechanical work, 2 into clerical work, and the vocations of the remaining 6 are unknown.

Of the 24 who entered high school, 10 went to the Mechanic Arts High School, 3 to the English High School, 2 to the Latin School, 2 to the Commercial High School, and 7 to the general local high school. Three of the 24 left school before the close of the year. Strangely enough, these three were all from the technical school.

The standing of the boys in the first-year academic work of the high school was as follows: 7 ranked as poor, 11 as fair, 4 as good, and 2 as very good.

The above facts and figures would seem to indicate that the primary purpose for which the school was established, as stated in the opening paragraphs, had been achieved. The most important result of the Agassiz School work, however, is to be seen in the several experiments in industrial education which it helped to promote in Boston and which are quite fully described in the annual report of the superintendent of schools for 1910.

The Cleveland Elementary Industrial School [1]

The city of Cleveland has been a pioneer in things educational. It is not surprising, therefore, to find that, with her large number of manufacturing and commercial interests, she has taken a prominent part in the establishment of those school activities which, with differing shades of meaning and purpose, have been variously characterized as the manual and domestic arts, manual training, or industrial education.

The Cleveland Manual Training High School was one of the first of its kind to be organized in the United States, and within a few years of its establishment the type of work given therein was extended downward into the elementary grades.

The more recent movement to "motivate" the work of the high schools met with early and adequate response by the establishment of the Technical High School and the High School of Commerce, the first of which was opened for the enrollment of pupils and the organization of classes on October 5, 1908, and the second just one year later.

The Elementary Industrial School, which was opened in September, 1909, and which it is the purpose of this article to describe, is intimately related to these earlier innovations in public education. The Technical High School was established with the purpose of providing an educational institution of strictly high-school standards, employing, it is true, somewhat different methods and appealing to different interests, but open only to graduates of the elementary school.

The Technical High School has been extremely successful. The report of the committee on the place of industries in public education of the National Educational Association says:

> The Technical High School of Cleveland seems to the committee to approach most closely to the definition previously given for such a school.

[1] Prepared by the author for the first number of *Vocational Education*, published at Peoria, Illinois.

There are several "technical high schools" in the country, but an examination of their courses of study will show that they do not differ radically from ordinary manual-training high schools.

Successful as the new school proved to be, it failed completely to influence the educational plans of the children who drop out of school at the sixth or seventh grade. This confirmed the school authorities in their belief that an institution employing somewhat similar methods, but nearer to the critical point in the school system, was an essential unit in that system. The Elementary Industrial School, which had been in contemplation for some months, was therefore established as an "experiment station."

The problem was frankly admitted to be one of general education rather than of industrial training, and the investigation undertaken was addressed to the specific task of improving the course of study for Grades 7 and 8, especially with reference to those children who had not met with ordinary success under the methods of instruction commonly employed in the preceding grades.

Briefly outlined, the plan was as follows:

(1) A course of study was to be developed parallel to the existing course for Grades 7 and 8 which would *appear more attractive* to the children in question, and which would actually *prove* to be *more helpful* to them whether they remained in school for a longer or a shorter period.

(2) The school day was to be lengthened to six hours.

(3) One half the time was to be devoted to handwork.

(4) The time devoted to each of the book subjects in the regular elementary school was to be reduced by two fifths and was to be related to possible vocational interests of the pupils, not only those illustrated by the handwork of the school, but those possible of illustration by the prominent commercial and manufacturing activities of the community. That is to say, these

manual and vocational realities were to be made the central features of the school, and around these were to be grouped all the other school activities.

(5) The fundamental features of these subjects were to be presented without too great elaboration, which frequently, through its very variety of illustration, proves to be most confusing to the young pupil.

The educational theories, advanced in support of this plan, laid especial emphasis on the necessity of appealing to the children's desire for motor activity and their interest in and dependence upon concrete actualities. In fact, on hearing an explanation of the relation existing between the handwork and the book subjects in this school, the writer was strongly reminded of the ideals of the earlier advocates of manual training. It seemed as if here was an attempt to realize more fully — perhaps, happily, to realize completely — the aims of the pioneers of twenty-five years ago, which, we are sometimes told, have not been realized because their promoters failed in the very practicality which they professed to believe was fundamental. The following quotation from an official report of the school might well have been taken from some address made before an educational body two decades since.

On the other hand, this school rests upon the recognition of the fact that very many of the failures of children in the work of the schools are due not to lack of ability on the children's part, but to the failure to consider the needs of the hand-minded or practical-minded children on the part of the current systems in their one-sided attention to the language-minded and imaginative, — in the reliance upon the imagery of words and abstractions, rather than upon the actualities of concrete life, both in learning and doing.

Elsewhere it has been observed that hand-minded children who had gained in their classes the reputation of dullards, and who had themselves lost faith in their powers, were restored to confidence and learned to make satisfactory progress even in previously distasteful subjects, when opportunity came to them to exercise their powers in matters which appealed to their mental constitution and seemed to them worth while. If these children

were to be afforded an opportunity to make the best of themselves, they must be approached from the side of the practical; they must learn by doing in order to do. Thus alone could they be led to the cultural, to the discovery of the inestimable value of knowledge, of science, of art, and even to the pursuit of these for their own sake. Thus, alone, could the school hope to place them in full possession of their human inheritance, to reach and to stir into the fullest self-active life every phase of their mental constitution.

With these plans and theories as guiding principles, the elementary industrial school was organized as follows: A ten-room building on Summer and East Thirteenth streets, a locality fairly central, was selected in which to house this experiment. There are three recitation rooms, one study room, one cooking room, one sewing room, two woodworking rooms, one drawing room, and one small room which was set aside to be equipped on different occasions as a model living room, dining room, bedroom, or sick room. This room is not yet equipped for the purposes for which it was intended, but the furniture and other fittings are being made by the pupils.

The management of the school is nominally in the hands of a director who acts as principal, but the influence of the supervisor of manual training is everywhere apparent in the organization of courses and in the spirit of liberal judgment which pervades the school. Contrary to the practice obtaining in most industrial schools, no special commercial or shop experience is demanded of the teachers as a necessary qualification. The two requisites are that they must have been excellent teachers either in the grade work or in the domestic or manual arts, and that they must be entirely free from that bias which long experience in the traditional schools frequently gives. The teachers finally chosen are well described as scientific as to subject matter and inspirational as to methods of instruction.

While a single center was selected in which to make the experiment, it was intended to have the enterprise of common interest to the whole city. Therefore each principal was given

the opportunity of sending from one to four boys or girls to this school. The selection of these children was made after consultation, and invariably with the consent of the parents. Only retarded children were desired. To be eligible for admission to the school, the boy or girl must have been in the sixth grade for at least a year, must be thirteen years of age or over, and at least two years behind grade, the grade being determined on the supposition that the child would begin school at the age of six and progress one grade a year. Furthermore, the principals were requested to send only such children as, in their opinion, would otherwise withdraw from school altogether.

In the light of the method of selection, it is interesting to examine the characteristics of the children who attended this school the first term. There were one hundred and forty-three children of whom approximately two thirds were boys. In age they varied from twelve to seventeen years, with an average of fourteen and two-tenths; and in grades they ranged from the fifth to the seventh, indicating a departure from the original plan, but the children of the fifth grade were very rare exceptions.

The school brought together a group of children who had been rather unsuccessful in the regular school work, who had lost interest, and who had especially lost confidence in themselves. In some cases the boys and girls had been difficult to control, to say the least. They were said to be poor writers, poor spellers, poor in their grasp of the processes and applications of arithmetic; in short, they were distinctly of the "anti-book" type.

The course of study employed may best be considered under two heads, the constructive or handwork, and the book or study work, though the supervisor of manual training says that "the important feature of the course of study is the close correlation and unity of all the subjects."

The handwork comprises practice in working drawing, free-hand drawing and applied design, woodworking, cooking, sewing,

and a little printing. These serve to call attention to certain vocations, as mechanical or architectural drawing, carpentry, cabinetmaking, pattern making, printing, domestic and laundry work, nursing, and dressmaking. That the handwork is considered to be of great importance is evidenced by the fact that approximately one half of the time is devoted to it. This makes it possible to carry the work much farther than in the grade school. The work for the girls goes more thoroughly into household science and art, and includes the purchase and preparation of foods, the service of meals, laundry work, the care of the sick, the furnishing, adornment, and care of the home, and the making of garments. The boys work for a time on general courses, but are allowed to specialize on either mechanical drawing, wood turning, pattern making, cabinetmaking, carpentry, or printing, during the major part of the second year. A part of the product of this work becomes the property of the pupils, in which case they pay for the material used; and the remainder of it, consisting of project and group work for the school, remains in the school.

There is little in the equipment of the school kitchen, the sewing, woodworking, and drawing rooms, or in the work done therein, to distinguish the school from an exceptionally well-equipped, well-organized, and thoroughly modern elementary school. The chief difference is in the liberal allotment of time, which makes a corresponding difference in the amount of work done, and, to some extent, in its nature. This latter, however, is not marked, but it should be recalled that this is absolutely consistent with the expressed purpose of the school, and indicates a confidence on the part of its promoters in the efficacy of manual training as a factor in general education.

In the book work some radical departures are made from the course of study for the grade schools, though it is maintained by the teachers and the superintendent of schools that

the fundamentals of each subject in the curriculum are given. This, furthermore, is done in less time,— a total of only about fifteen hours a week. The subjects are classed as follows:

English, which includes reading, writing, spelling, practical composition, and story-writing.

Arithmetic, the four fundamental processes, percentage (one case), decimals, and fractions, all related as closely as possible to the handwork or illustrated by the keeping of school or of personal accounts.

Geography-history, which is taught as one subject and springs from the consideration of commercial and industrial phenomena.

Hygiene of a thoroughly practical character.

Perhaps the most distinctively characteristic work of the school is the geography-history. It is believed that to put the child in intimate touch with his immediate environment is the very best way to interest him in the study of more distant places and people. Therefore the location, climate, topography, and soil of Cleveland are studied and described. These in turn explain the manufacturing, commerce, and history of Cleveland, which are studied in the most practical way possible. The children are taken on excursions to manufacturing plants, to the flour mills and the large distributing concerns. The railroads and other means of transportation are discussed, and this leads to an understanding of the life and work of the people of Cleveland, their varying interests, and their connection with other parts of the country and with other days. Visits to the grain, cattle, lumber, or steel centers carry the children far afield, to be brought back by their work in the school kitchen and shops. The teaching of this subject appears to be especially efficient, and the classroom has the appearance of a museum of industrial products. The exhibits are neither large nor numerous, but are fairly representative of local industrial interests, and the

children are helped by them, as well as by the instruction, to a comprehension of some of the industrial possibilities which the future may hold in store for them.

It is rather difficult to speak of the "results" of any educational experiment, because of the variety of influences which may have affected them. This is peculiarly true when the data are drawn from a comparatively small number of cases, and cover so short a period as that during which the Elementary Industrial School has been in existence. However, judgment and opinion are better guides than blind prejudice, and since some prejudice still exists against anything industrial in the domain of elementary education, the writer will venture to state what, in his opinion, the two years seem to show.

The pupils came to the school from different parts of the city, some of them having to ride in the street cars from six to seven miles, others walking three or four miles to and from school. It was stated by the children that many of them had taken out work and school certificates before coming to the industrial school, and yet, at the end of the second year, out of the 143 originally enrolled, 52 still remained, 33 boys and 19 girls, and of these 49 graduated. The figures show that many of the children left school, as was to have been expected, but constant additions were made, and the total membership at the end of the second year was 146, distributed as follows: in the first-year class, 56 boys and 27 girls; in the second-year class, 42 boys and 21 girls. The first graduating class numbered 53, and of these 19 expected to enter the Technical High School and 1 a regular academic high school. The figures show conclusively that this school has exerted a strong influence in retaining children who would otherwise have become early and probably unskilled workers.

Another result of the school seems to be an awakening of real interest on the part of the children, and especially the

development of a considerable self-respect and confidence,—a confidence which appears to be deserved. They have been given things to do which they could do well, and this has had the effect of making them more self-reliant in all their work. They are able to learn some things without being taught, which is an extremely valuable asset for these children who are likely to become wage earners at an early age. As an illustration of this, the work in printing may be mentioned. In one corner of the drawing room is a small equipment for printing, costing perhaps one hundred dollars, and this some of the boys have been permitted to use. They are self-instructed, having drawn from the public library such books as they needed to help them in making a beginning. There is no teacher of printing in the school, yet the boys have made considerable progress.

Not the least valuable of these results is the changed attitude of the children toward schools and school life in general. They have enjoyed their school, and have used it not alone for work but for social pleasures. Several plays, for example, have been well given. Few pupils think it desirable to leave school, while statistics show the extreme eagerness with which children of this type usually sever, permanently, their connection with the grade school. It seems fair to assume that, even though these children must go to work in the near future, they will all the more readily and naturally turn to such other educational institutions as may be open to them, as evening or continuation schools. There is thus a hope that they may become permanent students so far as study becomes at once necessary, available, and appropriate.

Quite apart from the benefit of this school to its pupils, is its value, as an experiment, to the cause of education in general. The value of an experiment is apparent in proportion to the fidelity with which it adheres to its avowed purpose. Judged from that standpoint, the writer feels that the Elementary Industrial School has proved to be extremely useful, and predicts that its

lessons, should the school be continued or multiplied, will be studied with interest and profit by students in elementary education throughout the country.

The school *has* remained constant to its stated principles, as we have seen, and it is not criticism of either the principles or the practices of the school to note that it differs materially from other elementary industrial schools which have been established in several cities within the past five years. In fact, the peculiar value of this experiment can best be shown by contrasting it with others. In most of these schools especial emphasis is placed on the *industrial nature of the handwork.* A practical and commercial product is desired, and all the conditions of the production and frequently of its disposition are made to conform as closely as possible to those actually encountered in the industrial world.

It was apparently partially in protest against such practices that the Cleveland experiment was undertaken. In an editorial in the *Manual Training Magazine* for April, 1910, Mr. William E. Roberts, the supervisor of manual training, said :

> It is the trade school, the continuation school, the elementary industrial school with a purely utilitarian purpose, that are being considered and suggested, rather than the preparation of material which they must use, the product of the established elementary schools. The danger lies in dealing with industrial education as apart from and added to the school system, instead of making it an integral part of that system by reorganization.

Quite consistent with this thought, the handwork of the Cleveland elementary industrial school is made a central but a cultural factor, while industry, not being the primary end sought, is utilized in both the handwork and the book or study work, but especially in the latter, as a vitalizing principle.

That the work of this school is believed to be of value is evidenced by the fact that Cleveland has established a second elementary industrial school. The purpose of the new school

is to try the experiment of relating the industrial work a little more closely to the regular school course and especially to the regular school organization.

The new experiment is conducted in a regular elementary-school building centrally located in one of the largest districts of the city. The school accommodates, as formerly, all the children of the first five grades in the district, and, in addition, all pupils wishing to take the modified course in the sixth, seventh, and eighth grades, who live within a much larger district, including some six or eight neighboring school buildings. Pupils from the central building who wish to take the regular course in the higher grades are permitted to go, on request, to one of the other elementary schools. Such requests have rarely, if ever, been made.

The work is conducted on the departmental plan, as in the Elementary Industrial School; it is arranged, however, for a regular five-hour school day instead of the six-hour day. In the seventh and eighth grades three hours each day are given to book work on a plan which brings each pupil in contact with three different teachers. Two hours each day, in these grades, are devoted to some kind of handwork, largely domestic science and sewing, with a little free-hand drawing for the girls and woodworking, mechanical and free-hand drawing for the boys. The children of the sixth grade have but one hour of handwork a day and four hours of book work.

There are about one hundred and thirty-five pupils in the three upper grades.

It should be noted that the two experiments described above, those of Boston and Cleveland, exemplify radically different methods of employing the handwork in their attempts to accomplish essentially the same educational purpose. These schools should not be confused with those of secondary type, whether intermediate or high.

Other experiments in the field of prevocational education which amply repay study are to be found in Newark, New Jersey; Indianapolis, Indiana; St. Paul, Minnesota; Los Angeles, California; Seattle, Washington; Springfield and Evanston, Illinois; and Fitchburg, Massachusetts. Only a brief outline of the work of these schools can be given here.

Indianapolis, Indiana

The semi-industrial schools are open to both boys and girls, and their courses of study parallel those of grades seven and eight. The pupils come mainly from those grades, but a small proportion of them are over-aged boys from Grade 6.

The new course of study has been placed in certain of the schools, and in those schools it is not elective but is taken by all children in grades seven and eight. On application pupils may be transferred to some other school with the traditional course, but no such request has ever been made.

The range of industrial activities is as follows: carpentry, joinery, repair work, art metal work, printing and bookbinding, sewing, dressmaking, art needle work, weaving, cooking, and housekeeping.

Newark, New Jersey

The Warren Street School offers a three years' course to boys only, and draws its pupils from all parts of the city.

Pupils may enter at the beginning of the sixth grade, or later in the course, regardless of age; or may be admitted, if fourteen years of age or over, from lower grades. Few are actually under fourteen.

The work has a more intensive trade significance than in most schools of this type, and the boys appear to be more mature.

The industrial subjects are carpentry, metal work, pattern making, foundry practice, electrical wiring, printing, and electrical

construction. It is expected that all pupils who enter at the beginning of the sixth grade will have some work in each of the industrial branches offered.

"The school places its graduates in positions suitable to their ability and inclinations. This feature of vocational guidance was successfully started in July, 1911, when seventeen out of twenty-one graduates were placed in positions. The remaining graduates entered the high school or moved from the city."

The school is in its third year.

St. Paul, Minnesota

The Special Industrial Schools of St. Paul have been in operation since 1908, and are open to boys only. These come not only from Grades 7 and 8, but, in the case of seriously retarded children, from the sixth or even the fifth grade.

The purpose of the school is to take boys who have little prospect of completing the work of the common school, and "give them a sort of finishing course before they go to work."

A three years' course is offered. Not only does it help the boy if he is forced to enter industrial life at an early age, but its completion is accepted as preparation for certain courses in the high school. A few boys have entered the high school through this channel.

The industrial activity is largely woodworking, but observational study of other kinds of work is afforded by carefully planned and supervised visits to shops and factories.

Springfield, Illinois

The Springfield Vocational School was opened in September, 1911, and occupies the upper floor of one of the elementary buildings. It comprises two rooms, one of which is equipped with desks, seats, and a reading table well supplied with appropriate

current magazines. The other contains a small but complete plant in which actual printing and bookbinding are done by the pupils. The boys are taught printing from the setting of type to the operating of the press. They are also taught the binding of tablets, pamphlets, and simple books. The teacher is a practical printer of considerable experience. The book or study work is in charge of an especially competent grade teacher.

The school is open to boys from any part of the city, thirteen years of age or over, who have completed at least the first five grades and who are recommended by the principal of the school which they attend. The capacity of the school is forty boys. The length of the course is not yet determined, but will be at least three years.

Evanston, Illinois

Mr. Walter W. Petit, principal of the Evanston Elementary Technical School, which was organized in September, 1911, writes regarding the purpose of the school as follows:

> Manual training for the boys and domestic science for the girls has been given in the upper grades of the elementary schools of Evanston for the past ten years.
>
> The elementary technical school differs, however, from the other schools of the city in that half the time is given to industrial work. Pupils from the fifth to the eighth grades are enrolled. Their work in the regular subjects of the grammar-school course covers but half the school day.
>
> Articulation with the classical high school of the town is provided for, so that while the child is able to secure a grasp of a number of elementary industrial processes, he does not find himself in a school in which the ultimate aim is entirely different from that of the other grammar schools. This is necessary in Evanston, for the town is a residence suburb of Chicago with practically no industries, and most of the children continue their studies in high school.
>
> The child can be prepared for high school by devoting but half the time to academic work, because of the increased interest he has in his school work. Self-confidence aroused by the industrial work carries over into the academic work and results in better progress. Correlation of academic

and industrial subjects aids in securing interest. Comparatively small classes with forty-minute periods, a part of which is devoted to supervised study, probably helps to account for the increased ability of the child to master his book work.

There are about one hundred children enrolled. None of these have been required to enter the school, and so far no child who has enrolled has voluntarily left the institution. The school has admitted as many as it was originally planned to accommodate, and there are at present a number on the waiting list. Three teachers give their entire time to the academic; and two to the industrial, work. In addition three other teachers give part of their time to the industrial work of the school.

Woodwork, cooking, sewing, millinery, and laundry work are taught. All pupils devote from two to eight hours a week to applied art. Under this department come block printing, stenciling, weaving, metal work, bookbinding, and leather work. The school has been furnished with a printing press, and the upper-grade boys have done considerable printing. This has been accomplished with practically no supervision. The seventh and eighth grades print the programs for the Friday literary exercises, advertisements of public lectures and evening classes, letterheads, and practically all the school work.

The boys in the eighth grade spend eighty minutes a week in cooking. Such articles of food are prepared as might be served in camp or at breakfast at home. This has proved a very popular course with the boys.

In the seventh grade the boys devote two hours a week for half a year to pressing and cleaning clothes, patching, darning, and sewing on buttons. The girls of the fifth grade are taught the use of ordinary woodworking tools.

When first planned, the school met with some opposition among the more conservative elements. This is, however, rapidly disappearing, and a demand will probably come for more industrial work in the other schools of the city.

As yet, only slight emphasis is placed on the vocational significance of the work in this school.

Fitchburg, Massachusetts

Another school which offers opportunity for diversified work in Grades 7 and 8 is the Practical Arts School, of Fitchburg. This school has been erected and equipped by the state of Massachusetts to furnish opportunity for observation and practice

to the students at the Fitchburg Normal School, who are preparing to teach in the upper elementary grades. Pupils from any part of Fitchburg who have completed the sixth grade are admitted. Four courses are offered, the successful completion of any one of which admits the pupil to the high school, where he may continue the line of work upon which he has begun, or may take a fresh start by electing a different course.

The four courses are as follows:

A Commercial Course, 30 hours per week, for those who expect to take the commercial course in the high school or business college, or who intend to go to work in offices or stores at the end of the grammar grades.

12½ hours to literature, composition, spelling, penmanship, mathematics, geography, history, and science.

7½ hours to physical training, music, general exercises, and recesses.

5 hours to bookkeeping, business forms and procedure, business arithmetic, and related design.

5 hours to typewriting and handwork.

A Literary Course, 30 hours per week, for those who expect to go on through the high school and college.

12½ hours to literature, composition, spelling, penmanship, mathematics, geography, history, and science.

7½ hours to physical training, music, general exercises, and recesses.

5 hours to a modern language.

5 hours to drawing, designing, making, and repairing (household arts for girls).

A Manual-Arts Course, 30 hours per week, for those who expect to take the industrial course in the high school, or who intend to go to work in the trades, the mills, or the factories at the end of the grammar grades.

12½ hours to literature, composition, spelling, penmanship, mathematics, geography, history, and science.

7½ hours to physical training, music, general exercises, and recesses.

10 hours to drawing, designing, making, and repairing.

A Household-Arts Course, 30 hours per week, for girls who wish to devote a large amount of time to the arts of home-making.

12½ hours to literature, composition, spelling, penmanship, mathematics, geography, history, and science.

7½ hours to physical training, music, general exercises, and recesses.

10 hours to household arts.

Some of the forms of work undertaken the first year are as follows:

Ordinary repairs:

Faucets in the buildings repacked.

Schoolroom desks and tables scraped and refinished.

Setting glass.

Lawn mowers taken apart, cleaned, oiled, and sharpened.

Window screens painted.

Decayed basement floors relaid.

Broken furniture glued.

Chairs reseated.

Rubber pads on the stairs taken up, turned, and retacked.

Woodworking:

Workbenches constructed.

Assisted in making kitchen tables.

Making teachers' desks for entire building.

Building partitions and lockers.

Painting and finishing:

Steam pipes bronzed to match color of walls.

Floors oiled.

Chairs for building bought in the white, finished and seated by pupils.

Kitchen, dining room, woodworking room, and locker rooms painted.

Workbenches and teachers' desks finished.

Library room painted and papered.

Grading and walks:

Work upon grading, and upon the building of concrete walls and granolithic walks has just begun. Each boy has plotted the grounds and walks and has taken levels under competent direction.

Typewriting:

Copying of letters to industrial plants in various towns and cities of Massachusetts, asking for material for industrial exhibit. Original letters to school children in different parts of New England, telling of Fitchburg industries and requesting replies concerning the industries of their cities.

Copying letters to parents, explaining courses offered.

Manifolding copies of poems and songs used in seventh and eighth grades.

Copying bills for books, school supplies, and materials used at manual-arts school.

Practice in writing business letters and business forms.

Typewriting language and spelling lessons.

Physical culture:

Personal hygiene.

Social and classical dancing.
Outdoor and indoor games.
Corrective work with individuals.

Household arts:

The girls have made their needlebooks and work bags, their gymnasium suits and the bags to carry them in; also their caps and aprons for cooking. They have hemmed the towels for the kitchen, made covers for 18 typewriters, and for 170 bean bags to be used in games in the gymnasium. They have repaired the flags for the school building, darned the rug in the reception room, and are to make overalls and jumpers for the boys to use in painting. They have cleaned the windows in the kitchen, dining room, and sewing room; cleaned all the basins in the new building; have reseated chairs; and are now beginning their lessons in cooking.

Applied arts for girls:

Stenciling of designs upon workbags and needlebooks.
Designing covers for and binding books and magazines.
Crocheting table mats for dining room and knitting wash cloths.

An unusual amount of time, as will be noticed, is given to handwork, which takes the form chiefly of typewriting in the commercial course, and which in the other courses is devoted to a great variety of useful and necessary labor. No work is undertaken except in response to a real need. The finished work must meet the need adequately, and must be performed with dispatch and in a workmanlike manner. Pupils are therefore directed not only by teachers but also by skilled journeymen, who work with them. Beauty of design, color, and ornament are not neglected.

The school carries into effect the very latest and best ideas of grammar-school instruction by means of differentiated courses, with complete equipment and adequate teaching force.

While this volume deals with examples of industrial education which are in actual operation, it is perhaps permissible to note in this connection an elementary industrial course which has been projected for the Chicago public schools. The fact that the Chicago Board of Education has recently adopted an "industrial course of study for the sixth, seventh, and eighth grades" is at least indicative of current discussion and of partial conviction on the part of the school authorities. In the Course of Study for the Elementary Schools is the following:

INDUSTRIAL COURSE

The Industrial Course of Study is not offered for general use in the elementary schools at the present time. Principals who are satisfied that the conditions in their districts are such that at least four divisions in the upper three grades can be organized and maintained in the industrial courses, should confer with the superintendent of schools. No divisions should begin the work without special permission from the superintendent.

Suggestive Program

9.00–9.30.	Mathematics
9.30–9.40.	Music
9.40–10.20.	English
	Penmanship
	Physiology
10.20–10.35.	Recess
10.35–11.05.	History and Geography
	Civics
	Chicago Course
11.05–11.30.	Study

	Boys	*Girls*
1.00–2.20.	Shop	Textiles
		Drawing and art
		Bookbinding
2.30–2.35.	Recess	Recess
2.35–3.30.	Drawing	Cooking
	Design and art	Laundering
	Printing	Printing

An examination of the course of study, which is given in some detail, shows that the word "industrial" as used therein has the same content as the term "manual training," and that the plan simply contemplates a curtailment or simplification of book work and an increase in the amount of time devoted to handwork, for its general educative value, and with slight emphasis on its vocational significance.

Los Angeles, California

The Macy Trade School, or the Girls' Vocational School as it is soon to be called, might possibly be classified as a separate industrial school, and as such be treated in the succeeding chapter. But it indicates so well the general movement of the Los Angeles school system toward a more rational adjustment of school opportunities to the needs and desires of the children below the high school, that it is described here. The school is a recent addition to the system, and will graduate its first class in February, 1912. Its purpose is to prolong the school life of as many of its pupils as possible until the sixteenth year; to awaken an interest in the industrial life of the community and to develop a desire to take part in it; to lay the foundation for a trade training; and to prepare the children to be economically valuable to themselves and to society.

The school is at present open to both sexes, but in September, 1912, it is planned to establish a similar one for the boys, reserving the present school for girls only.

Pupils are regularly admitted when fourteen years of age and prepared for the seventh grade. These requirements are not rigid, however, and may be modified in the case of children who are peculiarly qualified to pursue this course to advantage. The work practically parallels that of the seventh and eighth grades, except that the book work is much simplified and the handwork is greatly extended.

The seventh grade devotes ten hours a week to book work and fifteen hours to handwork, while the eighth grade devotes fourteen hours to the former and sixteen hours to the latter. The subjects studied are arithmetic, English, drawing, geometry, geography, history, and calisthenics, for both boys and girls; cooking, sewing, and design for the girls, and shop work for the boys.

On satisfactory completion of two years' work a diplom given, which admits the pupil to the high school.

The membership of the school at present consists of th seven boys and fifty girls.

The industrial courses for the girls have been more worked out than those for the boys. A circular listing t reads as follows:

COURSES OFFERED 1912–1913

SEWING	I.	Simple handwork
	II.	Underwear
	III.	Wash dresses for children
	IV.	Wash dresses for adults
	V.	Shirt waists
	VI.	Fine handwork
	VII.	Power operation (simple)
	VIII.	Power operation (advanced)
	IX.	Dressmaking (simple)
	X.	Dressmaking (advanced)
COOKING	I.	Plain cooking
	II.	Advanced cooking
	III.	Breakfast and luncheon dishes
	IV.	Dinner course
	V.	Home economics
	VI.	Lunch-room practice
ENGLISH	I.	Correct English (simple)
	II.	Correct English (advanced)
	III.	Oral reading
	IV.	Spelling and word building
	V.	Letter writing and dictation
	VI.	Composition
	VII.	Literature (selected)
	VIII.	Shakespeare
TEXTILE DESIGN	I.	Simple
	II.	Advanced

Art	I.	Free-hand drawing (beginning)
	II.	Free-hand drawing (advanced)
	III.	Applied design on textiles
	IV.	Pottery
	V.	Leather work
	VI.	Metal work
History	I.	U. S. history to 1789
	II.	U. S. history, 1789–1912
	III.	Social and industrial history
	IV.	History of California
Geography	I.	Industrial geography
	II.	Geography of California
	III.	Textiles
Music	I.	Chorus work (unison)
	II.	Chorus work (two-part songs)
	III.	Chorus work (three-part songs)
	IV.	History of music
Arithmetic	I.	The four fundamentals
	II.	Fractions, decimals, and percentage
	III.	Trade-school arithmetic

Each course covers five recitations weekly for ten weeks and carries one credit for completion. Forty credits will entitle a pupil to graduation.

The school authorities are taking steps to establish a vocational bureau based on the plans worked out by the Vocation Bureau of Boston. Already visits of investigation have been made to upwards of seventy-five places employing children, including factories, dressmaking establishments, department stores, tailors' shops, commercial houses, etc., for the purpose of ascertaining the vocational possibilities for girls in Los Angeles.

As noted above, this school is indicative of a general educational activity looking to the material improvement of the opportunities for those who seem least likely to profit by the older and more abstract courses of study.

At the Castelar Street School a new domestic-science building has been erected, the first in the city to be used exclusively

for that purpose and in connection with an elementary school. It will be used both by the pupils of the regular classes and by the after-school classes mentioned below.

The work given will include much wider application of the practical arts for girls than is usually to be observed in the sewing and cooking classes with which we have become familiar. Cooking, sewing, housekeeping, nursing, sanitation, the selection and purchasing of foods, and the preparation and serving of the school luncheons will be carried on with as large a measure of practical utility as possible.

A plan recently put into operation, which can hardly be considered as having a vocational purpose, yet one easily possible of extension in that direction, is that of opening the school facilities to volunteer classes from three to five o'clock in the afternoon, that is to say, for an after-school session. This work is carefully supervised by competent teachers, but is intended to appeal to the interests and to develop the initiative of the children, the teacher directing or guiding, rather than instructing and compelling compliance with fixed courses of work or rules of discipline. Classes of this type are in successful operation in nine schools.

The superintendent, Mr. John H. Francis, has determined to adapt the schools of Los Angeles to every possible phase of the many-sided life of a growing and cosmopolitan city.

Seattle, Washington

In the Northwest considerable progress is being made. It should be recalled that, with the opportunities which a comparatively new and rapidly developing country affords, the demand for special vocational training is not so insistent. Nevertheless Seattle has taken an advanced position regarding industrial education and vocational training in the elementary and

intermediate fields of education. Special elective courses of the prevocational type have been arranged with the expectation of meeting more satisfactorily the educational needs of both boys and girls during the period of early adolescence. The following circular sent to the parents of some of the Seattle public-school children will describe the movement.

THE ELEMENTARY INDUSTRIAL SCHOOL

The Board of School Directors of the Seattle public schools have authorized the opening of three industrial schoolrooms or centers.

The purpose of this circular is to explain the aims, plan, and program of such a school, the requirements for admission, its relation to the high school, and some of the reasons which have led to its establishment.

The elementary industrial school is intended to provide a course of study relating much more to the industries than the ordinary school program, and containing a more practical training for a class of boys and girls in the public schools who are naturally suited by instruction which will the better and sooner prepare them for training in a definite vocation. In every school there are some boys and girls who prefer studies and exercises that employ their hands, and who have greater aptitude in such studies than their fellows. They advance in their development by what they do rather than by what they hear. They are practical-minded. Many such children drop out of school as soon as the law permits, not from lack of ability, but because the school fails to fit its procedure to their particular needs. The establishment of these industrial classes is an attempt to fit the school to the wants of this class of pupils. Such classes are not substitutes for a trade school, but are intended to lead more quickly and surely to apprenticeship in business or trade, while not closing the door to further study either in high or special schools, if the pupil desires to pursue such a course.

The plan provides distinct courses for boys and for girls, and requires that those taking such courses be separated from the regular school classes in the building.

The school day, which is the same as for the regular classes, will be divided into seven periods of forty minutes each, about half of the time to be spent upon the ordinary school studies, modified to suit the end aimed at in this plan, and the other half to be devoted to the industrial and household arts — shop work and mechanical drawing for the boys, and cooking, sewing, design, and drawing for the girls.

OUTLINE AND EXPLANATION OF INDUSTRIAL COURSES

For Boys	*For Girls*
English	English
Geography-history	Geography-history
Arithmetic	Arithmetic
Mechanical drawing	Drawing and design
Shop work	Sewing
	Cooking

English will include reading, spelling, penmanship, letter writing, and composition.

Geography will include map studies, climatic conditions and influences, industries and products, exports and imports, routes and centers of trade, the studies to be correlated as far as practicable with the work in shop and kitchen.

In history there will be a review of the influential events in the development of our country, including particular reference to the country's greatest characters and their achievements, and of the causes contributing to our present national standing. The purpose will be to give an elementary knowledge of the important facts in our history and to imbue with a patriotic desire to be serviceable.

In arithmetic the fundamental operations include fractions applied in shop work and in local problems; percentage and interest; applications of measurements and mensuration. The purpose will be to secure accuracy in the use of figures and practice in their application to practical affairs.

Industrial. The shop instruction will consist of work intended to give knowledge of materials and their sources and use; tools and skill in their use; methods of construction; problems in machine and hand work; acquaintance with factory and individual production; the use of preservatives, as paints, oils, etc.; discussions of the various vocations; visits to work under construction — to manufacturing and commercial establishments.

The industrial work for girls will consist of plain sewing, garment cutting and fitting, repairing; the study of household linens, fabrics used in the home, the sewing machine; also class talks and discussions regarding clothing, hygiene, style, costs, methods of manufacture, the sweatshop, trades and vocations for women. Attention is also given to plain cooking, properties of foods, economy, table service, sanitation, laundry work, care of the home, etc. Actual conditions make possible the purchasing and preparing of a simple lunch daily and serving the same to other pupils at noon at cost. Class talks are given upon related topics of home life and its

obligations, domestic service, income and expenditure, etc. Applied design is taught, including surface decoration as affected by material and service, the use of color, problems in making designs for notebook covers, belts, pillows, draperies, and the æsthetics of the home.

The Relation of this Course to the High School

The rank of this course will correspond to the seventh and eighth grades of the usual school course, and will require two years for its completion. At the end of the two years pupils completing this course, who choose to continue their school work, may enter the high school upon an equal footing with the pupils entering from the regular course.

Requirements for Admission

This course is open to any boy or girl thirteen years of age or over, who has completed the equivalent of the present sixth grade, provided the parent or guardian makes a written request upon the form provided for that purpose, and, further, that the principal of the school last attended by the pupil recommends that the pupil should take the industrial course.

As only three schools can be established at this time, the number of pupils will have to be limited to 72 boys and 72 girls. Do you wish to have —— attend one of these schools? If so, please sign your name below as indicative of your desire to have —— chosen.

While differing materially in several important particulars, all of the above schools agree in the following fundamentals:

First. They admit the need of providing a secondary motive in education at this critical time in the life of children, and believe that this motive is closely associated with vocational interests.

Second. They believe that spending half the time in handwork and half in book work secures a greater and more permanent development of the pupils' intelligence, particularly for the concrete-minded type of children attracted by these schools, than is possible where the entire day is devoted to academic study. Successful accomplishment is recognized as the best incentive to continued effort.

Third. They do not interpose a barrier between the elementary and the high school, but, quite to the contrary, they have created a new channel by which it may be reached.

In commenting on prevocational work, Mr. George A. Mirick,[1] acting superintendent of schools, Indianapolis, says: "This form of education will not eliminate all the failures from the schools, but it is diminishing their number. For many children school has become a place where they have been trained *to bear defeat unresistingly*. For a growing number of them the elementary industrial school has become a place where they are taught *how to attain success*."

[1] Now Deputy Commissioner of Education, New Jersey.

CHAPTER XI

THE INTERMEDIATE OR SEPARATE INDUSTRIAL SCHOOL

While these schools have much in common with the prevocational work of the elementary school, there is one considerable difference. They do not commonly permit later entry into high schools, though the work which they offer sometimes duplicates portions of the high-school course. They are intended particularly for boys and girls who, having arrived at the age of fourteen, find themselves out of harmony with schools and school purposes, as they see them, and who would, failing the opportunity afforded by the industrial school, probably seek immediate entry into industrial life.

They therefore occupy an "intermediate" position between the elementary-school work and that of the traditional high school. They are in a sense "separate" from both and "independent" of their domination. In a sense also they are "secondary," if not "high." Each of these words has been used to designate this type of school.

While these schools frequently offer four years of work, it is generally conceded that the children entering them are commonly desirous of taking a short-term trade course. The schools therefore appeal directly and immediately to the vocational interests of their pupils, and build on the vocational motive, making it a central and predominant factor in the work of the school, thus approximating the reality which attracts so many children away from school life.

Schools of this type have been most needed where traditional education is most strongly intrenched and blindly unyielding to

the needs of the majority of the school children. They hav therefore come into prominence in the older and more con gested sections.

In some instances where the economic needs of the pupi are greatest, the book work is reduced to a minimum, and prep aration for immediate industrial efficiency is made the first an most evident consideration. This is notably the case in th Manhattan Trade School, New York, which is mentioned late and in the Girls' Trade School of Boston. For this reason suc schools might be classified as "trade schools," as their name would seem to indicate that they should be, but the *purpose* o these schools and the fact that they appeal to pupils of the sam age and possessing the same general characteristics as do othe intermediate industrial schools seem to warrant the classificatio here made.

The Rochester Shop School, Rochester, New York

Perhaps the best example of this type of school is th Rochester Shop School, formerly known as the Factory Schoo Its purposes have been clearly defined from the first and it methods have been simple and direct. It is, for this reasor one of the most interesting and instructive experiments i industrial education which the author has ever seen.

The principal, Mr. Lewis A. Wilson,[1] states that the purpos of the school is not to teach a trade but to develop in every bo initiative, productive power, and a trade character. He believe that the "product system," which characterizes the methods c the school, is one of the most important and valuable feature

The following description of the work of the school wa prepared by Mr. Wilson.

On December 1, 1908, the Rochester Factory School was opened t supply a definite need in the city's industrial life. The previous May th

[1] Now principal of the Albany Vocational Schools, Albany, New York.

state passed a law providing for aid for general industrial and trade schools, and Rochester was the first city to take advantage of the new state law.

The Rochester Factory School has for its aim the training of boys along general industrial lines, and in the fundamental principles pertaining to certain trades, but does not aim to teach a trade. It does aim to develop efficiency and rapidity in execution, so that those who go out with a diploma will be better fitted to enter their chosen trade than they would be under prevailing conditions.

When the school was first opened only one course, cabinetmaking, was offered. Forty boys were enrolled and two teachers gave the instruction, one in shop work and the other in grade work and drawing. This proved so successful that on the following February a course in electricity was offered. At this time two more teachers were employed, one to give the electrical work and the other to take charge of the grade work. The mechanical drawing from this time on was taught by a special teacher. By this time the number of boys had increased from forty to one hundred.

From February, 1909, to February, 1910, the school was run on the above basis, but it was then discovered that the existing corps of shop teachers could not give instruction in all the lines of work desired by the boys, and this led to the establishment of two new courses, those in carpentry and plumbing. This necessitated the hiring of two additional shop instructors and a principal. In September, 1910, courses in architectural drawing and machine design were added.

Courses are now offered in cabinetmaking, carpentry, electricity, plumbing, architectural drawing, and machine design. The length of each course is two years, forty weeks a year and thirty hours a week.

The weekly apportionment of time in each course is as follows:

Shop work	15 hours
Shop mathematics	5 hours
Drawing	5 hours
English	2½ hours
Industrial history	1½ hours
Spelling	1 hour

Home work on spelling and shop mathematics is required of all students to the extent of five hours a week. The boys in the electrical department are required to spend three hours a week on electrical theory.

The following table gives a comparison of the time allotment of the eighth grade of the regular schools and that of the Rochester Shop School.

ROCHESTER SHOP SCHOOL	
Shop work	900 minutes
Arithmetic	300 minutes
Drawing	300 minutes
English	150 minutes
Spelling	60 minutes
Industrial history	90 minutes
Total, 30 hours	

GRADE SCHOOLS, GRADE	
Manual training	120 m
Arithmetic	250 m
Drawing	60 m
Language, grammar	250 m
Spelling	75 m
Reading, literature	150 m
Writing	75 m
History	250 m
Civics	85 m
Physical training	75 m
Music	60 m
General exercises	25 m
Total, 25 hours	

The school is under the immediate supervision of the Board of cation, and is maintained by funds supplied by the state and the ci is free to any of the boys in the city who are in or above the sixth and are at least fourteen years of age.

The organization of the school can be considered nearly ide shop teachers having classes of from thirteen to fifteen, and the grad drawing instructors classes of from twenty-five to thirty.

These teachers, six in number, exclusive of the principal, have selected with reference to their training along both practical and theo lines, and they have especial qualifications for their work, which th doing most efficiently. There is one teacher each for cabinetmaking trical work, carpentry, and plumbing; one who teaches drawing, ind history, and geography; and one who instructs in shop mathematics, lish, and spelling.

It is the aim of the school to provide conditions resembling those in actual practice, and for this reason the school has more the air of than a school. Partly for this reason the sessions are from 8.30 to 11.3 and from 12 M. to 3 P.M., the early closing in the afternoon giving tunity for the boys to find outside work and thus prolong their school

It is not the intention to have any fixed time for graduation, as may enter the school at any time during the year and may be gradua soon as he completes the prescribed course.

Many boys have left the school during the past year, compelled so in many cases because of the necessity of giving financial aid tc parents. The following figures may be interesting:

Returned to other schools	25 boys
Entered classified trade work	30 boys
Entered unclassified trades	20 boys
Left the city	7 boys
Unknown	38 boys

The number of boys returning to other schools is mainly due to the location of the Rochester Shop School. Some returned to the grade schools, however, for the purpose of reaching a higher standard before entering the practical work. The number of boys working at unclassified trades is partly due to the fact that some were too young to be admitted to a trade.

Following is a detailed description of each department of the school, giving the equipment, the outline of work, and typical examples of the practical finished product.

CABINETMAKING DEPARTMENT

The instruction offered in this department aims to cover the general work of the cabinetmaker, with special emphasis on the work required by the local industries. The department is a complete little factory, with its stock room, assembly room, and finishing room. Each boy is promoted according to his ability, but a corresponding high standard is required in the supplementary instruction.

The equipment of the department is as follows:

Stock Room

2 No. 1 American saw benches.
1 No. 1 American horizontal boring machine.
1 No. 1½ American planer (24″).
1 American band saw (30″).
1 American jointer.
1 Moore belt sanding machine.
1 Holmes swing cut-off saw.
1 thirty-inch grindstone.
1 filing vice.
2 motors.

Assembly Room

6 six-foot cabinetmakers' benches.
6 cabinetmakers' tables.
1 set glue coils.
1 seven-pot glue tank.
4 dozen cabinetmakers' clamps and hand screws.

Each bench is equipped with the following tools: block plane, jack plane, smoothing plane, $\frac{3}{8}''$ chisel, $\frac{3}{4}''$ chisel, $4\frac{1}{2}''$ square, $9''$ square, gauge, hammer, nail set, knife, awl, mallet, backsaw, $3''$ saw driver, $9''$ screw driver, bevel, brace, half-round file, oil stove, oil can, and counter brush.

Finishing Room

2 cabinetmakers' benches with same equipment as in assembly room.

1 fitting table.	Varnishes.
1 staining table.	Shellacs.
Stain and varnish pots.	Brushes.
Stains.	Upholstery supplies and equipment.

Outline of Work

Assembly room. Names and uses of tools with instructions as to their handling and care. Preparation of glue, preparation of joints, "gluing up" of joints, methods of assembling furniture, preparations for assembling furniture, assembling of furniture, "cleaning-up" of furniture, inspection of furniture, filing and setting of saws, sharpening of scrapers and chisels.

Lectures on glue, nails, clamps, screws, dowels, woods, grades and kinds of tools, fittings.

Stock room. "Getting out" rough stock, work on cut-off saw, saw and band saw, jointing of material, planing of material, making of machine joints, setting up of machines, care of motors.

Lectures on general care of machines, kinds of machines, machine joints, matching of lumber, grading of material, arrangement of machines, shop methods, shafting, belting, care of motors, sandpaper, speed of machines.

Finishing room. Fitting of furniture locks and fixtures; shellacking, staining, varnishing, rubbing, upholstering, making stains and wax.

Lectures on care of brushes, stains, shellacs, varnishes, fillers, alcohol, benzine, turpentine, rotten and pumice stone, fittings, preparation of woods, kinds of finishes, upholstering material.

Product manufactured during the past two years:

260 bookcases.	62 sawhorses.
18 kindergarten tables.	25 bench rests.
32 saw boxes.	100 drawing kits.
25 drawing tables.	200 primary looms.
12 sewing boxes.	50 large looms.
100 toy knitters.	15 "special orders."
120 chairs.	12 costumers.
24 flat-top desks.	36 manual-training benches.
1 dining-room table (sample).	1 buffet (sample).

Every article manufactured by the Shop School must be something needed in the public schools and which the Board of Education would otherwise purchase, and must have an educational value. The education of the boy comes first, the product is secondary. All the product is "run through" in lots of six, with time and stock cards.

ELECTRICAL DEPARTMENT

The work in this department aims to cover a general course in all branches of electrical work. The boys do all the repair work on the bells, telephones, gongs, motors, and lights in the public schools.

The equipment in this department is as follows:

1 Jacobson gas engine (5 horse power).
1 Rochester Electric Motor Co. D. C. generator (2 k. w.).
1 Rochester Electric Motor Co. D. C. motor (2 h. p.).
1 Westinghouse A. C. 3-phase motor (5 h. p.).
1 Elbridge Electric Co. generator (1 k. w.).
1 set castings for D. C. motor (2 h. p.).
1 hot-air engine.
1 Westinghouse induction motor (5 h. p., 220 volts).
1 Wagner Electric Co. single-phase motor (5 h. p.).
2 General Electric arc lights.
1 telephone exchange board.
1 pair standard scales.
Voltmeter and ammeter.
19 shop benches.

Each bench is equipped with the following: fine file, medium file, coarse file, file brush, small screw driver, large screw driver, pliers, $\frac{1}{2}''$ cold chisel, $\frac{3}{8}''$ cold chisel, 1″ cold chisel, calipers, scrapers, 5″ steel square, large claw hammer, machinist's hammer, tinsmith's hammer, 2′ ruler and wrenches.

The tool room contains many extra tools, such as breast drills, hand drills, feeling bits, bench drills, large and small tap wrenches, large stock, medium stock, and small stock, dies and taps, coil winder, splicing clamps, countersinks and braces, snips, large hand drill, etc.

OUTLINE OF WORK

Mechanical work. Chipping, filing, bending, squaring, drilling, countersinking, surfacing, polishing. This work is done in the manufacturing of products needed in the Shop School, such as pulley supports and guides for bookcases, conduit and pipe straps, girder clamps, and bench stops.

Sheet-metal work such as the making of zinc plates for wet cells, window plant boxes, cut-out boxes, waste and ash cans, motor hoods. This work includes the development of surfaces, use of gutter tongs, tap and die work, soldering, and reënforcing.

The making of wet, crowfoot, chloride, and dry cells, manufacture of telephone and telegraph instruments.

Lectures on care of tools, metals, mechanical and chemical mixture of cells, plumber's furnace, blow torch.

Stripping and splicing of wires by the use of pliers, splicing clamps, blow torch, soldering iron, solder and flux, taping of joints and splices with rubber and friction tape.

Wiring of the following systems and circuits: series, parallel, shunt, series parallel and parallel series, opened and closed circuits, grounded circuits. Installing and testing of bells, annunciators, buzzers, fire alarms, door openers, telephones, telegraph instruments, messenger call boxes, gas lights, etc., and their circuits.

Lighting circuits. Installation of lighting circuits involving the following: knob, cleat, molding, conduit work, two- or three-wire circuits, direct and alternating circuits, single and double pole, three-way and four-way switches, panel boards and cabinets, fixtures, balancing of circuits, carbon and metal filament lights, tantalum and tungsten lights, arc lights, meters.

All the work in the wiring is designed first in the shop and worked out there and tested. This work is done under the rules of the National Board of Underwriters.

Lectures on static electricity. Induced charges, electroscopes, attraction and repulsion, potential difference, friction machines, and induction machines.

Circuit electricity. Electric current, pressure, capacity, condensers, Leyden jars.

Electrical cells. The simple cell, voltaic cell, volta pile, polarization and depolarization, open and closed circuit cells, bichromate cells, Bunsen chloride, Le Clanché, Daniell, gravity, and dry cell.

Storage batteries. Description of the various types of storage batteries. Installation and care of the various types of storage batteries.

Electrolysis. Electrolytic conductors and cells, chemical actions, and application of Faraday's laws. Theory of electrolysis.

Magnetism. Natural and artificial magnets, compass and dip needles, magnetic induction, distribution of magnetism, magnetic fields, lines of force, magnetomotive force.

Electric current and circuits. Ampere, volt, ohm, Ohm's Law. Determination of the resistance of wire, series, parallel, series parallel; parallel series, shunt circuits.

Power work. Installing, repairing, testing, and care of D. C. series-, shunt-, and compound-wound generators and motors. Shop tests on above as to heat on full and over load. Power-consumption and efficiency tests, indicated and brake horse-power tests, voltage and speed tests. Dissembling and reassembling of all the above machines. The winding of fields and armatures.

Gas-engine practice and tests. Power and efficiency. Indicated and brake tests for horse power. Dissembling and reassembling of parts of engine, care of engine, etc.

Installing, repairing, testing, and care of A. C. generators and rotary converters. Single-, two-, and three-phase types. Induction and synchronous motors with their starting devices. Installing of transformers and oil switches.

Comparison of alternating and direct currents, frequency, phase, course of current, pressure, self-induction, lag of alternating current, application of Ohm's Law, testing, heating and chemical effects of alternating current, power and power factor, effective current and pressures.

Design and manufacture of synchronous motors, induction motor, rotary converters, arcs and incandescents, and electric power plants.

Electrical energy. Electromagnetism, electromagnetic induction, galvanometers and voltmeters, measurement of electrical resistance. Measurement of current and pressure, measurement of capacity, direct-current dynamos and motors, shop methods.

The electrical department has charge of the repairing of the bells, telephones, gongs, batteries, and lighting systems of the public schools of the city; also the installing of new work. This affords an opportunity for the boys to secure practical experience under ideal conditions.

The following are examples of the repair work done:

September 19, 1910, School 15 — Repairing telephones.
September 27, 1910, School 33 —Repairing fire gongs and telephones.
October 5, 1910, E. H. S. — Repairing motor.
October 19, 1910, School 26 — Installing 5 h. p. motor.
October 24, 1910, School 4 — Repairing lights in manual-training room.
November 15, 1910, School 5 — Installing stereopticon lantern.

PLUMBING DEPARTMENT

The instruction in this department is designed to give the boy a clear insight into the plumbing trade. Students work from their own blue prints and designs made in the drawing room, and a high standard of work is required in their supplementary instruction.

The equipment of the department is as follows:

3 work tables for joint wiping.
1 large bench for pipe cutting and tap and die work.
1 Ryder pumping engine.
3 gas solder-melting furnaces (complete).
2 No. 32 gasoline torches.
1 large pipe vise.
1 machinist's vise.
1 No. 1 set common stock and dies.
1 No. 3 set Armstrong pipe and dies.
2 No. 1 Saunders pipe cutters.
1 No. 2 Saunders pipe cutters.
1 No. 1 Barnes-Saunders pipe cutters.
12 sets of the following tools: 12″ rasp, 12″ coarse file, turn pin, oval shave hook, tap borer, soil cup, soil brush, 6″ compass, bending pin, 10″ gas pliers, hammer, dresser, ladle, large and small wiping cloths, and copper bits.

Following general tools: yarning irons, calking irons, joint runner, ladles, bending springs, drift plugs, Stillson pipe wrenches, Warnock wrenches, burner pliers, comb pliers, flat-nose pliers, hack saws, steel squares, Disston saws, ratchet brace, set of bits, expansion bit, levels, plumb bobs, screw drivers, heavy hammers.

Stock of sinks, bath tubs, basins, closet combinations, boilers, traps, ells, tees, unions, nipples, couplings, and all common and special fittings.

Outline of Work

Pipes and fittings. The cutting and threading of wrought-iron pipe and making use of the proper size and kinds of fittings in assembling same for simple water- and gas-supply systems.

Cutting cast-iron soil pipe, and yarning, pouring, and calking joints. The proper supporting and fastening of cast-iron and lead pipes.

Plumber's furnace. Care and operation of the plumber's furnace and blowtorch.

Copper bit work. Tinning of soldering irons. Preparing and making the following seams and joints: butt seam, bead or V-seam, lap seam, cup joint, beaded joint, overcast joint.

The using of flux in soldering lead, tin, brass, copper, iron, galvanized iron, and zinc.

The proportions and melting points of strip solder.

Wiping solder, wiping cloths, joint wiping.

Testing of proportions and melting points of wiping solder.

Purifying and keeping solder in good condition.

The folding and preparation of moleskin and ticking wiping cloths.

Preparing and making the following wiped joints: $\frac{5}{8}''$ and $1\frac{1}{4}''$ horizontal round joint, $\frac{5}{8}''$ and $1\frac{1}{4}''$ upright round joint, $\frac{5}{8}''$ horizontal and upright branch joint, $1\frac{1}{4}''$ floor flange.

Wiping joint on $\frac{5}{8}''$ lead and soldering nipple.

Wiping joint on $1\frac{1}{4}''$ lead and soldering nipple.

Wiping joint on 2″ lead and brass ferrule.

Wiping joint on 4″ two-bend and brass ferrule.

Wrapping wall flange.

Water supply and distribution. Running cold- and hot-water supply to kitchen, laundry, and bathroom, including regular range boiler connections. Setting up and connecting a kitchen sink.

Lectures. Use and care of tools, solder and fluxes, wiping cloths, joints and their use, study of local plumber's rules and regulations.

Elementary plumber's physics. Study of questions and answers.

Installing of plumbing. Installing a complete drainage, ventilation, and hot- and cold-water-supply system, including the setting-up and connecting of laundry trays, sink, refrigerator, closet, bath, and lavatory.

Tests. Applying the water, air, smoke, and peppermint tests.

Hot-water circulation and tank-pressure systems. The changing of the above water-supply system to a circulating system with tank pressure and connections for furnace and instantaneous water heater.

Setting up and connecting other fixtures and appliances as follows: shower bath, sitz bath, urinal, anti-freezing closets, slop sinks, pantry sinks, drinking fountains, gas logs, instantaneous water heaters, force pumps, water lifts, and Ryder pumping engine.

Lectures. Drainage, ventilation, and water-supply systems; anti-siphon and vented traps; direct, tank, and pneumatic-pressure systems; boiler connections, windmills, pumps and water lifts; disposal of sewage; special fixtures and appliances, estimating specifications, costs, shop reports, plumber's rules and regulations.

This department has charge of the plumbing repair work in the public schools of the city, and the following are examples of the work done:

September 21, 1910, School 18 — Repairing closet tank and automatic tilting tank.

September 23, 1910, School 13 — Repairing broken water pipes.

September 28, 1910, School 8 — Repairing leak in closet tank.

September 30, 1910, School 4 — Repairing leak in flush pipe.

October 7, 1910, West High — Connecting of gas plate.

November 7, 1910, School 11 — Repairing sanitary drinking fountain.

November 9, 1910, School 24 — Installing basin bowl and repairing basin cocks.

November 10, 1910, School 25 — Removing stoppage in basin waste.

CARPENTRY DEPARTMENT

The work in this department aims to give the boys a thorough foundation in all woodworking processes. A considerable part of the time is devoted to repair work in the public schools under the guidance of the instructor.

The equipment of this department is as follows: 13 six-foot benches each equipped with the following tools: cut-off saw, backsaw, hammer, gauge, steel square, large try-square, small try-square, bevel, $\frac{3}{8}''$ chisel, $\frac{3}{4}''$ chisel, half-round file, block plane, jack plane, jointer, smoothing plane, oil can, oilstone, and mallet.

The special tools are as follows: ripsaws, crosscut saws, universal planes, plows, circular planes, large square, levels, rabbet planes, braces, bits, hand drills, screw drivers, draw knives, compasses, bars, files, rasps, putty knives, spoke shaves, saw set, slip stones, files, and grindstones.

Outline of Work

Use and care of the tools.

Making of lap joints, mortised and tenon joints and dovetailing, application of work in practical shop problems required.

Work on the roughing-in of an ordinary dwelling.

Foundation walls and piers.

Sills (solid and boxed).

Joists, girders, and lookouts.

Studding (size, material, and setting).

Ribbon or girt.

Plates.

Rafters (various pitches, valley, hip, and jack rafters).

Trussing.

Cornices (parts, styles, and construction).

Siding and shingling.

Floors and subfloors.

Setting of door jambs.

Base blocks, corner blocks, head blocks, plaster casings, fillets, neck moldings, head casings, dust caps.

Baseboards.

Plate and chair rails.

Simple-stair building.
Winding-stair building.
Elementary mill work.

Lectures. Tools and their care, woods, shop methods, lumber measurement, glue, nails, screws, bolts, straps, fittings, framing, shoring and underpinning, roofs, stair building, outside work, interior finishing, finishing, paints, shellacs and varnishes, woodworking machinery. Thorough study of the building ordinances of Rochester.

Typical examples of repair work:

February 24, 1910, School 8 — Building partitions in cellar.

April 19, 1910, School 24 — Laying floors.

May 11, 1910, School 25 — Building teachers' lockers.

May 26, 1910, School 9 — Building supply cupboards.

September 27, 1910, School 2 — Building porch.

September 29, 1910, School 19 to School 11 — Moving of portable school building.

November 2, 1910, School 25 — Building of storm house.

DRAWING

A thorough course in shop drawing, based on the special needs of the trade, is given to each student. This work varies according to the product and repair work, as the students work from blue prints throughout the courses. The instruction is given by lectures, blue prints, and blackboard work. The student first makes his drawing on detail paper and it is checked by the instructor. He then makes a tracing of his drawing and later a blue print, which he takes to the shop.

The school furnishes a set of mechanical drawing instruments, T-square, angles, and drawing board.

SHOP MATHEMATICS

After a thorough review of arithmetic which proves to the instructor the ability of the student, the boy is given a course covering formulas used in his shop. The shop problems are prepared by the shop instructors and are in direct correlation with the changing work. This work involves arithmetic, algebra, geometry, and trigonometry.

INDUSTRIAL HISTORY

The course in industrial history is taken from Thurston's "Economics and Industrial History."

English

The course deals with business forms, shop reports, ordering of material, and written reports on factory-inspection trips.

Spelling

The words for this course are selected from trade reports, shop reports, trade journals, and from general industrial material.

While the money value of the work of the pupils is a minor matter, it is by no means inconsiderable. The following tabular statement, covering the work also of a second shop school more recently established, serves not only to show the money value of the work done, but to give appropriate emphasis to the most distinctive characteristic of this interesting school.

Cost of Rochester Shop Schools

January 1, 1910–January 1, 1911

	Rochester Shop School Lexington Avenue				Washington Shop School Clifford Av.	
	Departments					
	Cabinet	Carpentry	Plumbing	Electrical	Woodworking	Totals
Number of students	25	25	25	25	50	150
Equipment . . .	$ 267.09	$ 91.88	$ 146.81	$ 453.45	$ 225.00	$ 1184.23
Salaries	1775.40	1585.40	1585.40	1775.40	1940.00	8661.60
General expenses .	575.46	575.46	575.46	575.46		2301.84
Materials	1255.91	625.17	602.69	675.00	360.10	3518.87
Totals	3606.77	2786.03	2763.55	3025.86	2300.10	14,482.31
Credits	2135.00	805.60	455.00	1207.00	368.00	4970.00
Net totals	1471.77	1981.03	2308.55	1818.86	1932.10	9512.31
Cost per pupil . .	58.84	79.24	92.34	72.75	38.64	63.41

The Newton Independent Industrial School

The reasons advanced for establishing the Newton Independent Industrial School are those with which we have now become familiar, but in this case they gain peculiar significance. If there is a city in the United States which does not need a school of

this type, Newton, Massachusetts, a wealthy residential city, might safely be said to be the one.

Ayres's Table 32, showing the percentage of pupils retained to the fourth year of the high school in fifty-two cities, places Newton at the head of the list, with 38 per cent, its next competitor being Waltham, Massachusetts, with 29 per cent. This remarkable rating is more clearly seen by comparison with a few other cities taken from the list; Cleveland having only 10 per cent, Baltimore 6 per cent, Chicago 5 per cent, and New York 3 per cent. This percentage so exceeds that of any other city in the country as to place Newton in a class by itself. Notwithstanding this fact, the city had just erected a magnificent Technical High School building. It would seem to the casual observer as if the educational opportunities were all that could reasonably be asked, but the superintendent saw that the Independent Industrial School was needed also — a fact since thoroughly demonstrated.

The school was authorized by the city government in January, 1909. It was opened February 1, in one of the grammar-school buildings, but was moved in September to its present quarters, a six-room building on the corner of Watertown and Bridge Streets.

There were fifteen pupils and one instructor, and the work was such as could be done in one woodworking room and one classroom.

In December two more teachers were added, and the number of pupils increased to forty-five. The machine-shop equipment was installed in December and January, all of the work being done by the pupils. This equipment consisted of a 5 h. p. motor, 1 engine lathe, 1 speed lathe, 1 metal planer, and a combination woodworking machine. The woodworking equipment was an old manual-training outfit borrowed from a Newton school. Such was the humble beginning of an extremely valuable example of the separate, or independent, industrial school.

The school is open to boys at least fourteen years of age who would probably not enter the high school. The courses cover three years, and at the beginning devote about one half the time to book work and drawing, and one half to shop work. As the course advances, the time for shop work is increased. A pupil is given an opportunity to try each of several kinds of work, until he finds the trade for which he seems best adapted, and then is encouraged to specialize in that trade. The work offered is carpentry, cabinetmaking and pattern making, machine-shop practice, electrical construction, sheet-metal working, and printing.

The courses in the related book work and drawing follow:

Mechanical drawing. This course is primarily shop drawing and machine sketching. In the latter part of the course the drawing is related directly to the trade in which the pupil is specializing.

Mathematics. The instruction in arithmetic, elementary algebra, and geometry is intended to give the *industrial essentials* of mathematics. Special emphasis is given to square root, proportion, mensuration, formulæ, and the use of logarithms. Free use is made of mechanics' and engineers' handbooks for formulæ and tables. Examples are taken from shop work as far as possible.

English. The purpose of the English instruction is to give facility in reading and writing orders and business letters, and the taking of shop notes; to develop ability to consult sources of information along mechanical lines; and, as far as possible, to cultivate an appreciation of good literature.

Commercial geography. Pupils study the sources of the common materials, and the economic features of the countries of the world, trade routes, etc.

Science. The science given is related in a practical way to the shop subjects.

History. This shows the industrial and economic development of mankind from the earliest time to the present, giving special attention to the marvelous progress during the last century, and to the industrial history of the United States. Biographies of the great leaders in science, invention, and commerce are studied and written.

Government. The history leads to a study of the political conditions of the present time, and to some consideration of the great problems of labor and society.

The school is committed to the policy of turning out a real product. As each passing month sees some new practical outcome of its work, it is difficult to do entire justice to the versatility and energy displayed by the school's managers. Some of the things which they have accomplished are as follows.

WORK DONE BY PUPILS SINCE SEPTEMBER 12, 1909

For the Industrial School

For the woodworking shop. 4 sawhorses, 3 sandpaper boxes, 12 nail boxes, rack for bits, 12 chisel handles, oilstone shelf, lumber racks; built tool room; installed lathe, bandsaw, and jointer.

For the machine shop. 40 file handles, 1 pair of cone centers, 1 face plate, 10 pairs of calipers, 10 riveting hammers, 2 collar arbors, long parallel for planer, 6 planer stops, 6 clamps, 12 planer jacks, 12 bench plates, 3 nut arbors. Built benches, motor shelf, tool room, cabinet for tool room; put up timbers for shaftings; rebuilt gas engine (two-cylinder, four-cycle, 12 h. p.).

Patterns made. Gas-forge plate, motor frame, planer jack, lathe attachment (three patterns), shifter guide for band saw, surface plate, shipper arm, face plate, angle irons, bench blocks, driving pulley for motor, lathe dog; gas-engine patterns as follows: valve-rod guide, fly wheel, clutch, thrust bearing, starting crank, carburetor inlet; saw gauge (four patterns); combination punch and shear (four patterns); polishing disk; stakes for sheet metal (eight patterns); gas forge (three patterns); tool stand; arbor press; grindstone outfit (six patterns); tail-vise outfit (five patterns); bench lathe (twenty patterns); bookbinding press (six patterns).

For the electricity room. 20 individual experimenting cases, 30 spools for magnets, 30 square switch bases, 24 round switch bases, 30 square push-button cases, 15 round push-button cases, 4 wiring stands, demonstration table, box for wire, 4 turned cast-iron cores for magnets.

For the study room. 2 wastebaskets, finished over 12 seats and desks, bookshelves.

For the office. Filing cabinet with 7 drawers, bookshelves, wastebasket.

For the drawing room. 9 drawing tables, 1 blue-print frame, 3 boxes, 18 ink-bottle stands, 18 drawing boards, 18 T-squares, projection cage, wastebasket, large drawing board.

For the printing room. 4 type-case stands, 7 galleys, imposing table, cabinet for galleys and supplies, cabinet for press equipment.

For molding equipment. 10 two-part flasks, 10 bench rammers, 10 trowel handles, 30 sprues, 20 vent-wire handles, 10 rapping mallets.

For the sheet-metal shop. 6 benches for two pupils each, 1 small bench for filing vises, 10 tool racks, 10 boxes for solder, 3 stakeholders of oak, 3 patterns for hatchet stakes, 2 patterns for square stakes, 1 pattern for bottom stakes, 15 mallets, 10 scratch awls, 11 small hammers, 4 large hammers, 4 raising hammers, 4 peen hammers, 12 file handles, 7 round stakes made from gas pipes, three large stakeholders, repairs on old table which is used for stake support.

For the Newton Free Library. 1 fourfold cabinet screen.

For the Public Schools

For the Horace Mann School. 1 pair jumping stands, 1 filing cabinet with 6 drawers.

For the Claflin School. 1 pair jumping stands, 1 filing cabinet with 6 drawers.

For the Hyde School. 1 sand table ten feet long.

For the Emerson School. 1 modeling table, 1 blackboard stool.

For the Stearns School. 72 garden stakes, 1 aquarium.

For the Technical High School. 36 cast-iron bench blocks finished all over, 1 motor pulley (pattern and machine work).

Objects made in the tinsmith shop. 6 funnels, 6 pint measures, 1 quart measure, 1 tank for paintbrushes, covered table for printing room with sheet zinc, 2 templates for punching notebook sheets.

Printing jobs done for the School Department since February 20, 1911. 600 job cards; 300 machine job lists, 8½″ × 11″; 3500 circular letters, 4 pages, 9″ × 12″; 1000 grammar-school graduates' certification blanks, 8½″ × 11″; 800 catalogues of grammar-school textbooks, 18 pages; 300 catalogues of high-school textbooks, 13 pages; 200 combination of last two, 31 pages; 6000 school-report circulars, 6″ × 9″; 800 rules and regulations, 32 pages; 1300 graduation programs for high school, 12 pages; 1000 manila envelopes, 7″ × 10½″; 500 garden-inspection cards. For this work the Industrial School has been credited over $300 by the school department.

The work in printing was originally established on account of its educational value, but it rapidly assumed a vocational importance in the school, and now, with a practical printer in charge, forms one of the departments. The school prints a small paper called *Industry*, and the following quotations from it, written by pupils, are given partly for the information which they contain and partly because they illustrate the work.

INDUSTRY

Published by the Pupils of the

Newton Independent Industrial School

Newton, Massachusetts

Volume I MARCH, 1911 Number 3

Two Years of Work

Our School is now in the third year of its existence. The two years already spent have been years of steady, vigorous growth and development. From our beginning in a spare room in the Stearns Grammar School, with the use of the traditional manual-training equipment, we now have a whole building with machine shop, pattern shop, tin shop, printing office, drafting room, and assembly room. The one teacher who met the class on that cold morning the first day of February two years ago, is now assisted by three other men, all of whom are thorough mechanics in their respective trades. The number of pupils has increased from fifteen to fifty-five, with several applicants waiting for admission.

One aim of this school was to keep in school as many as possible of the large number of boys who leave at the age of fourteen or fifteen to go to work. Our success in this respect is apparent from the fact that ten of the original fifteen boys are still with us, while one is in the Technical High School and another in the Classical High School. This makes a loss to the school system of only twenty per cent in two years — a remarkable record when we consider that if it had not been for the Industrial School, hardly twenty per cent of this number would now be in school at all. Moreover, every boy in the advanced class has definitely chosen his trade and is specializing in it — five in pattern making, two in electricity, and the rest in machine work.

Our third year begins with greater promise than ever. The new instructor and new equipment for printing, the installation of the sheet-metal equipment, new machinery in the wood shop, and increased facilities in the machine shop, all make possible better work and greater opportunity for each pupil in the school.

OUR SHEET-METAL SHOP EQUIPMENT

GEORGE L. VENO

The greater part of the equipment in the sheet-metal department has been made by the pupils, who have thus gained valuable experience and also saved the school considerable expense. The equipment was made in two departments of the school, the woodworking department and the machine department. In the woodworking department there were made five benches, one stock table, twelve riveting-hammer handles, twelve mallets, twelve tool racks, twelve awls, six boxes for miscellaneous work, patterns for one anvil, and six different stakes. The following were made in the machine department: twelve riveting hammers, twelve tinsmith hammers, and twenty-four punches. The gas piping was also done by the machinists. The equipment purchased by the school consists of six gas forges, twelve soldering irons, and two machines for sheet-metal forging.

This department is now in complete working order. Two boys can work at each bench and are provided with all the tools needed. The boys taking up sheet metal have worked very hard in getting the equipment in place and preparing this shop for work. Mr. Froling, our drafting teacher, has charge of this department.

WIRING FOR ELECTRIC LIGHTS

JAMES FELL

We were greatly in need of more light in our building, and the fact that the boys were taking up electricity here and had an instructor that understood this science made it seem unnecessary to hire a contractor to do the job when we could do it just as well. We began the work of wiring, and, with the instruction of our teacher, have learned something that will be valuable to us when we start working at our trade.

An entertainment was to be held at the Technical High School on the evening of March 24. This necessitated more light in order that the pupils there could work. We got along so well with the wiring in our own school that we were sent to the Technical High School to do this temporary wiring.

CERTIFICATES AND DIPLOMAS FROM THE INDUSTRIAL SCHOOL

Superintendent Spaulding recently visited our school and made announcements regarding the matter of certificates and diplomas for Industrial School pupils.

Any pupil who has completed the sixth grade in the grammar school and does two years of satisfactory work in the Industrial School will be given the regular grammar-school diploma from the school from which he came, the two years here being regarded as the equivalent of the seventh and eighth grades in the grammar school. Upon completing the three years' course here, the pupil is given a certificate stating this fact and indicating the trade in which he has specialized. In order to secure the final diploma from the Industrial School, it will be necessary for him to work for a year in a shop approved by the school, during which time he shall send in weekly written reports to the school, describing the progress of his shop work, wages received, etc. If the year's work has been satisfactory to the employer, the diploma will be granted.

THE MANHATTAN TRADE SCHOOL, NEW YORK CITY [1]

This trade school for girls is now a part of the public-school system of New York City. Its early history as a privately supported institution is of absorbing interest, and has been tersely written by Mrs. Mary Schenck Woolman, in her book entitled "The Making of a Trade School." In this volume she gives an interesting account of the first experiment in the United States to deal in an adequate way with the problem of furnishing vocational training and guidance to children destined to enter industrial life, otherwise wholly unprepared, at the earliest possible age.

The aim of the school is frankly stated to be the giving of help to the youngest wage earners, but its ideals are of considerable breadth. They are to demonstrate to the community what education is needed for "the lowest rank of women workers" in order that a girl may become self-supporting and adaptable, "understand her relation to her employer, to her fellow workers, and to her product," and value health and moral and intellectual development.

The necessity for this effort was found in the unfortunate social and economic conditions, and especially in the lack of

[1] See p. 130.

opportunity for progressive work. "After several years spent in the market" the girl was found to be little better off than on her entrance into industrial life.

After investigation, trades were selected in which are used the sewing machine (foot and electric power), the paintbrush, paste brush, and needle. In organizing instruction all unnecessary waste was eliminated; short, intensive courses were planned to give knowledge and skill in the technical aspects of the selected trade, and to develop mental alertness on the part of the worker. It has been observed that "the academic dullness which is shown at entrance comes frequently from lack of motive in former studies." The fundamental importance of health and the value of trade art as a help to progress are given special emphasis.

The supreme value of the school's trade-order business, as an educational asset, is shown in the following quotation: "It provides the student with adequate experience on classes of material used in the best workrooms; these girls could not purchase such materials and the school could not afford to buy them for practice. The ordinary conditions in both the wholesale and the custom trade are thus made a fundamental part of instruction. Reality of this kind helps the supervisor to judge the product from its trade value, and the teaching from the kind of workers turned out. Through the business relation the student quickly feels the necessity of good finish, rapid work, and responsibility to deliver on time. The businesslike appearance of the shop at work on the orders, and the experience trade has had with the product, have increased the confidence of employers of labor in the ability of the school to train practical workers for the trades. . . . The business organization and management required in the adequate conduct of a large order department can itself be utilized for educational purposes."

A chapter devoted to representative problems makes an illuminating analysis of the difficulties which must be met and

solved by those organizing schools for workers in the lower grades of industry. While the instruction must be direct and specific, some preliminary general training is needed, and work intended to awaken vocational interests should also be provided. Mrs. Woolman believes that all this might and should be given in the public elementary school. Other difficulties are the keeping of the school organization flexible and sensitive to ever-changing trade conditions, and in "close contact with industrial and social organizations of workers in settlements, clubs, societies, and unions, that all phases of the wage earner's life — pleasures, aims, and needs — may be appreciated." There is the difficulty of securing suitable teachers, and of working in harmony with the ideals of organized labor.

The present quarters and equipment of the Manhattan Trade School represent an investment of about $200,000.

Mrs. Woolman's book is condensed experience, and, as such, is an epitome of the present movement for vocational education. This experience has had great influence on the organization and methods of the new industrial schools of the country, and the principles for which it has stood from the beginning have gained wide acceptance during the last three years.

The Secondary Industrial School, Columbus, Georgia

This was the first school of its kind in the United States to be established as a part of the public-school system and supported by public funds. It was established in 1906, and offers courses in the mechanic arts, textile arts, domestic arts, and business training.

While its name would seem to indicate that it might be classed as a technical high school, an examination of its entrance requirements and courses of study will show that, though "secondary," it is not conventionally a "high" school. The graduates, however, are admitted to the technological schools of Georgia and Alabama on extremely favorable terms.

A report of the public schools of Columbus for 1910 states the aim and the scope of the Secondary Industrial School as follows:

THE AIM

The aim of the Secondary Industrial School is to prepare the youth of Columbus and vicinity for intelligent and efficient service, and for good earning power in business life or the more important industries.

It is a trade school, and more; it is an academic-trade school of high-school rank. This means that the essentials of a high-school course are given and a trade is taught. Under the head of essentials are included the usual high-school studies in mathematics, English, history, and science. No foreign languages are taught. There has never been any intention of teaching young people a trade without good academic training. The aim of the school is to give that culture, intelligence, and mental acumen that carries the skilled mechanic on to unlimited earning power.

REQUIREMENTS FOR ADMISSION

Applicants for admission to the Secondary Industrial School must be at least fourteen years of age, and must have completed our sixth grade or have reached a degree of advancement equal to this.

The school is free to boys and girls of the city of Columbus, and open to any others upon the payment of a tuition fee. All students are charged $5.00 a term for books, supplies, and working materials. In addition to this fee, nonresident students pay $15.00 per term.

The school desires only such students as have a definite purpose to remain throughout the three-year course, complete the work, and receive a diploma from the school.

The school is in session from 8 A. M. to 4 P. M. The session begins the first Monday in September and ends the second Friday in July.

The apportionment of time among the several subjects of instruction is as follows:

First Year	45-minute periods per week
English grammar and classics	5
Arithmetic	5
Elementary physics	5
United States history, elementary algebra, ½ year each	5
	20
Industrial work	21

SECOND YEAR

Rhetoric and classics	5
Algebra and geometry	5
Elementary chemistry	5
Civics, history of western Europe, ½ year each	5
	20
Industrial work	20

THIRD YEAR

Advanced English, literature and classics, ½ year; physics, ½ year	5
Solid geometry and trigonometry	5
Chemistry	5
History of western Europe, economics, ½ year each	5
	20
Industrial work	22

The courses are conducted by a principal and five assistants. The principal, Mr. C. A. Maupin, states that the school is growing steadily in popularity, the attendance having increased 76 per cent in 1911, and the number of graduates having doubled.

A commercial product is turned out, and the closest relations are maintained between the school and the business and industrial interests of the community. One interesting illustration of this feature is given by Mr. Maupin. He says:

> The graduating class is given its final examination two months before the close of school, and the various members are sent out to positions in their particular lines, and required to work until graduation night, reports being received from their employers in regard to their efficiency, punctuality, and application to business.

The school has the assistance of an advisory committee.

Other schools of this type which will repay study are the Albany Vocational Schools, the New York City Vocational School for Boys, the Girls' Trade School and the Boys' Trade School, both of Boston, and the five vocational schools of Buffalo.

CHAPTER XII

VOCATIONAL HIGH SCHOOLS

Vocational high schools differ from the types previously described because they require, as a foundation, the complete training of the elementary school,[1] and because they plan to give a broader and perhaps a more thorough preparation for industrial pursuits. While carefully adapting the work to the needs of those who can spend but two years in the high school, a four-year course is offered and very commonly followed by the pupils.

Practices vary, but in the larger cities the tendency is in the direction of maintaining separate vocational high schools, as the Stuyvesant High School, New York City; the High School of Commerce (for boys) and the Practical Arts High School (for girls), Boston; the Technical High School and the Commercial High School (for both boys and girls), Cleveland; and the Lane Technical High School (for boys), Chicago. In the smaller cities of the Middle West the so-called "cosmopolitan high school" is strongly supported as superior to the separate vocational school, and, in fact, is much more appropriate to the local conditions.

The work in the several schools of this type, now well established, is so diversified that a full description of it would exceed the limits of the plan of this volume. It varies from instruction in machine-shop and foundry practice, cabinetmaking, pattern making, the building trades, and electrical work, to home making

[1] It is to be noted that exceptions have appeared to this, the general rule, and it is believed that, before long, many high schools will throw open individual courses to those who, having arrived at suitable age and having ability to follow these courses, yet fall short of the completion of the entire elementary-school program.

and housekeeping, domestic science and art, and the designing and executing of the artistic products of the needleworker and the costume designer.

It is to be regretted that our illustrative school does not include work for girls, but it is believed that the principles involved are capable of wide, if not universal, application. It may also be stated in passing that the High School of Practical Arts, Boston, a high school for girls only, presents in many respects a parallel case. While enjoying the advantages of some special legislation, it is, nevertheless, a genuine high school which has succeeded wonderfully well in meeting the individual needs of all of its pupils. A thorough study of this school is advised for all who are interested in the vocational education of women.

The Albert G. Lane Technical High School, Chicago

This school is essentially a manual-training high school for boys. As such, it may seem to be less appropriately used as an illustration of the type of vocationalized high school, which has been advocated in the foregoing chapters, than some school which differs materially from the traditional high school in important particulars of its organization and management.

It is partly because the "Lane Tech," as it is locally known, enjoys few if any advantages over other high schools in the country, — advantages of special legislation exempting from prescribed courses of study and other inflexible requirements, — and yet has succeeded in differentiating itself from the rest, by the spirit in which it has carried out these requirements, that this school is selected as an illustrative example.

For the sake of clearness let us note briefly, and by way of contrast, the superior conditions under which the Cleveland Technical High School, for example, works. This school was established on recommendation of a special commission representing the commercial and manufacturing interests of the

community. It has the assistance of an advisory committee representative of these interests, thus giving the school a vital connection with the commercial and industrial world. As a result it has a longer school day, the possibility of a longer school year for pupils desiring it, and special opportunities for intensive vocational work in the last year, including twenty-five hours a week permitted for specific trade work.

The Lane Technical High School has been given none of these special advantages. So far as courses of study, length of day or year, or submission to fixed scholastic standards are concerned, its plan is identical with that of the typical manual-training high school. Yet it has been made to serve the needs of the pupils so well that it stands out distinctly as belonging to the new type of "differentiated" or "motivated" high schools.

The Albert G. Lane Technical High School is an extremely large school, numbering from 1500 to 1650 pupils. It is housed in a building constructed to accommodate 1200 and first occupied in 1908, when the Hoyne School, organized in 1905, was transferred to the new building, the name of the school being changed within a year to that which it now bears. The building, land, and equipment cost nearly a million dollars, and the appointments are as complete as could well be expected in view of the rapidly changing ideas regarding technical and industrial training in high schools. That this enormous and expensive plant is administered with economy is shown by the relatively low per capita cost of about $81.00 a year.

In 1908–1909 and 1909–1910 the Lane School offered the usual four-year manual-training course to the boys of the district. From the beginning, however, and this marks the distinguishing characteristic of the school, the work in each subject was so reorganized and was made so thoroughly "practical" that the boy who was forced to leave at the end of the first or second year might do so with the conviction that he had accomplished

something of definite use to himself in a vocational way. At all events, the interests and efforts of the teachers and of the school in general were not centered on the *preparation* of the few who were to graduate four years hence. The needs of these boys were not overlooked or minimized, but the equal rights of the others were never forgotten. It was felt that preparation might be combined with accomplishment; that, in fact, tangible and definite accomplishment to-day was not only good in itself, but that it served as the very best preparation for the progress of to-morrow.

It seemed to the writer that here was the secret of the wonderful success of the school, the *shifting of interest* from the possible future graduate to the boy present in the school to-day; from *preparation* for some more or less distant attainment to the *accomplishment* of some present and immediately useful work.

As one passes through the school, realizing that tradition and the natural conservatism of teachers must have been as strong here as elsewhere, the wonder grows at the influence which has changed all this to the spirit of optimistic confidence felt everywhere in the school. Teachers and boys alike express confidence in their ability to solve any problem which the practical demands of the constructive work may present. While called upon to deal with large classes, frequently numbering forty-five pupils, these teachers are doing, in all branches, a type of work which few if any schools in the country five years ago would have believed possible for high-school pupils.

Let us examine in more detail the physical equipment of the school, the required course of study, and the nature of the work done.

As before stated, it is a large school. The ground dimensions of the building are 331 × 174 feet. There are eighteen class-rooms, a study room, assembly hall, a lunch room seating eight hundred, and a gymnasium. There are seven laboratories for

work in physiography, zoölogy, biology, physics, and chemistry, with perfectly appointed lecture and demonstration rooms. There are seven drawing rooms and the following shops:

A woodworking shop with seventy-two double benches, a grindstone, band saw, circular saw, wood-turning lathe, and two sets of steam-heated glue pots. In an adjacent room are a circular saw, single-surface planer, two band saws, a hand planer and jointer, a boring machine, grinder, and filing bench.

A wood-turning shop equipped with twenty-four benches and lathes, a grindstone, a wet grinder, a circular saw, and a band saw.

A pattern shop with twelve double benches, six speed lathes, two pattern makers' lathes, a grindstone, band saw, circular saw, two wood trimmers, steam-heated glue pots, and a gluing table. In the lecture rooms of the pattern and wood-turning shops are well-arranged seats and independently driven lathes.

A foundry, 40 × 80 feet, accommodating forty-eight students at one time, and equipped with molding benches, a two-ton cupola, three furnaces for soft metals, grinder, polisher, drill press, traveling crane, electric hoist, gas furnace, core, and molding machines.

A forge shop, similar in size, with forty-eight forges, and anvils, grindstone, drill press, grinder, punch and shear, and a two-hundred-and-fifty-pound steam hammer. A lecture room adjoins.

A machine shop, 60 × 80 feet, fitted for seventy-two pupils at one time, with an elaborate equipment of machine tools, including engine lathes, speed lathes, drill presses, boring and turning mill, milling machines, shapers, planers, and grinders, in great variety. A lecture room and a tool room adjoin.

A chipping and filing room equipped to accommodate twenty-four students at one time, and having, in addition to the benches and vises, a grindstone, wet grinder, shaper, drill press, and tempering furnace.

A pottery room equipped with a potter's wheel and kiln, and necessary tables, benches, and small tools.

The equipment of the electrical-construction shop will be given in full later.

The course of study is that prescribed by the Board of Education. It accords so closely with the traditional manual-training course that it is perhaps superfluous to give it, but it is included for the sake of clearness.

MANUAL-TRAINING COURSE

First Year

First semester	Weeks	Periods	Credits
English	20	4	.4
Woodworking	20	10	.5
Mechanical drawing	20	4	.3
Free-hand drawing	20	1	.05
Algebra	20	4	.4
Physiology	20	5	.4
Physical education	20	2	.1
		30	2.15
Second semester			
English	20	4	.4
Woodworking	20	10	.5
Mechanical drawing	20	4	.3
Free-hand drawing	20	1	.05
Algebra	20	4	.4
Physiography (with special reference to woods and ore)	20	5	.4
Physical education	20	2	.1
		30	2.15

Second Year

First semester	Weeks	Periods	Credits
English	20	4	.4
Foundry, forge, and pattern making	20	10	.5
Mechanical drawing	20	4	.3
Plane geometry	20	4	.4
Physical education	20	2	.1
		24	1.7

Second semester

English	20	4	.4
Foundry, forge, and pattern making	20	10	.5
Mechanical drawing	20	4	.3
Plane geometry	20	4	.4
Physical education	20	2	.1
		24	1.7

Choose one of the following:

Foreign language	40	5	1.0
Biology	40	5	1.0
Elementary physics	40	6	1.0
Chemistry	40	6	1.0

If chemistry is not taken now, it must be taken the fourth year.

Third Year

First semester

Machine-shop practice	20	8	.4
English	20	4	.4
Free-hand drawing	20	1	.05
Mathematics	20	4	.4
Physics	20	6	.5
Physical education	20	2	.1
		25	1.85

Second semester

Machine-shop practice	20	8	.4
Machine or architectural drawing	20	4	.3
Free-hand drawing	20	1	.05
Physics	20	6	.5
Mathematics	20	4	.4
Physical education	20	2	.1
		25	1.75

Choose one of the following:

History	40	4	.8
Language	40	5	1.0

Fourth Year

First semester

United States history	20	4	.4
Machine or architectural drawing	20	3	.2
English	20	4	.4
Physical education	20	2	.1
		13	1.1

Second semester

Civics	20	4	.4
Machine or architectural drawing	20	3	.2
Trigonometry	20	4	.4
Physical education	20	2	.1
		13	1.1

ELECTIVES

Chemistry	40	6	1.0
Language	40	5	1.0
English	20	4	.4
Electrical- or gas-engine construction	40	6	1.0
Electrical- or gas-engine construction	20	4	.4
Free-hand drawing	40	6	.8
Advanced physics	20	6	.5
Advanced chemistry	20	6	.5

One semester of English must be chosen during this year by those who have not taken a foreign language.

While the equipment and the course of study present little to distinguish this school from other manual-training high schools throughout the country, the *methods* of organizing the material and of giving the instruction are believed by the writer to be peculiar, or at least to have been given peculiar prominence. These methods dominate the work of the whole school, but perhaps they are most clearly shown in the working out of the two-year vocational course in electricity than elsewhere, and for that reason both the subject matter of the course and the equipment of the electrical-construction room will be given more detailed consideration.

In the fall of 1910 the Board of Education authorized ten different "two-year vocational courses," so called, to be offered by the several high schools throughout the city. Five of these were such as might appropriately be offered in the technical high schools, and the Lane High organized, among others, a course in electricity.

The course of study prescribed by the board was as follows:

TWO-YEAR COURSE IN ELECTRICITY

First Year

	Weeks	Periods	Credits
First semester			
Business English	20	4	.4
Algebra	20	4	.4
Physiology	20	5	.4
Elementary physics	20	5	.4
Mechanical drawing	20	4	.3
Free-hand drawing	20	2	.15
Physical education	20	2	.1
		26	2.15
Second semester			
Business English	20	4	.4
Algebra	20	4	.4
Elementary electricity	20	8	.6
Mechanical drawing	20	4	.3
Free-hand drawing	20	2	.15
Physical education	20	2	.1
		24	1.95

Second Year

	Weeks	Periods	Credits
First semester			
English	20	4	.4
or other modern language	20	5	.5
Geometry, or history with special reference to industrial and economic conditions, and civics	20	4	.4
Applied electricity	20	10	.7
Mechanical drawing	20	4	.3
Free-hand drawing	20	2	.15
Physical education	20	2	.1
		26	2.05
		or 27	2.15
Second semester			
English	20	4	.4
or other modern language	20	5	.5
Geometry, or history with special reference to industrial and economic conditions, and civics	20	4	.4
Applied electricity	20	10	.7
Mechanical drawing	20	4	.3
Free-hand drawing	20	2	.15
Physical education	20	2	.1
		26	2.05
		or 27	2.15

While the electrical-construction shop is not used exclusively by this class, having been equipped for fourth-year work, its facilities are utilized for important portions of the instruction of this class, and therefore a complete description of its equipment is to the point.

The electrical-construction shop is equipped with vise benches similar to those in the chipping and filing room, and cases for the reception of armatures, and other pieces under construction. The tool room, adjoining the construction shop, is furnished with cases and shelving for construction of motors, generators, arc lights, etc. Adjoining this room is a planing room equipped with vats used in the electroplating of finished work.

This shop is equipped with the following machines:

1 14″ Gould & Eberhardt shaper.
1 No. 1½ Brown & Sharpe universal milling machine.
4 12″ × 6′ Reed engine lathes, one equipped with turret head.
1 12″ × 6′ Hendey engine lathe, electric driven.
1 14″ three-spindle Henry & Wright sensitive drill.
1 14″ one-spindle Henry & Wright sensitive drill, electric driven.
1 Wiley winding machine.
1 E. M. Bliss & Co.'s circle shear, electric driven.
1 circular metal saw.
1 12″ Star power hack saw.
1 No. 5 Walsh inclinable punch press with open back, motor driven.
1 No. 19 Bliss armature disk slotter, motor driven.
1 14″ Ransom double-dry grinder.
1 24″ Leland & Falconer single wet grinder, motor driven.
1 39″ × 5″ grindstone, with Brown & Sharpe trough and truing device.

The lecture and testing room is furnished with a motor-generator set, which gives the following electrical currents: 4 to 8 low voltage, direct current; 110 direct current; 80 alternating current; 1-, 2-, and 3-phase currents. These currents, in conjunction with the house current of 200 volts direct current, give a wide range for the testing of machinery, instruments, lamps, etc. In conjunction with these rooms is a dark room for the storage of cells and the setting up of instruments for the measurement of light.

Even more pertinent and illuminating are the notes which were prepared in the school to be used as a basis for the courses.

NOTES TO BE USED AS THE BASIS OF A TWO-YEAR VOCATIONAL COURSE IN ELECTRICITY[1]

PHYSICS — FIRST SEMESTER

General notes. Give only such work as will be of value as a basis for the courses in electricity and electrical construction which are to follow. (This is as much as can be assimilated, and it will be of value even if the electrical courses are not taken.)

Study the English and metric units of length, omitting the decimeter and all metric units greater than the meter.

Memorize 2.54 cm. per inch, 39.37 in. per meter. Study areas and volumes, particularly of cylinders.

Memorize $\overline{6.45 \text{ cm.}}^2$ per square inch, $\overline{16.39 \text{ cm.}}^3$ per cubic inch.

Density. Instead of actually finding the density, find the weight by determining the volume and using the known density, as in practice that is the problem.

Memorize the density of water, iron, copper, aluminum.

Hardness. Show experimentally the hardening and tempering of steel, the hardening of brass and other metals, and the annealing of iron, steel, aluminum, and other metals. These experiments will serve as a basis for the study of magnetism and electromagnets, the use of tools, and the spinning, punching, and general manipulation of metals.

Memorize the relative hardnesses of the common metals.

Elasticity. Study springs for making electric contact of steel, brass, phosphor bronze, etc. Use as basis for the study of condensers.

Tenacity of iron, steel, brass, copper, aluminum, lead, etc., as bearing on supporting wires for copper conductors, with and without lead covers; the relative merits of copper and aluminum for conductors; binding wires for armatures of brass and steel wire, etc.

Ductility, with particular reference to wires of brass, copper, aluminum, German silver, platinum, and resistance wires.

Cohesion. Experimental work as far as possible on soldering, galvanizing, electroplating, brazing, shellacking, gluing, enameling, painting, emphasizing the need of clean surfaces, fluxes, etc.

Brittleness. Glass, porcelain, lava, marble, slate, vulcanized fiber and rubber, asbestos wood, and other insulators.

Force. Use the dyne and gram, but without defining the dyne except as 1/980 of the gram.

[1] By Ernest J. Andrews, head of Department of Electrical Construction, Lane Technical High School.

Composition of forces in the same and opposite directions, and at angles, as a basis for electromotive forces in series, counter electromotive forces, and alternating electromotive forces of various phases.

Motion at least to the extent of making clear peripheral speed, omitting acceleration.

Gravity (very elementary). Nothing on falling bodies or the exact laws of gravity.

Inertia as a basis for inductance, bringing out the constant conflict between force and inertia, force tending to change motion and inertia tending to keep it constant; particularly, as an incident of this, centrifugal force, as bearing on the disruption of armatures, etc.

Pendulums, to the extent of emphasizing and elucidating the abovementioned conflict, and as a basis for the study of vibrations of tremblers, sound waves, telephone disks, etc.

Work, energy, and power. To be studied as fully as possible. Bring out the idea of torque and its measurement in foot pounds.

Machines. To be studied pretty fully; show how the speed (but not power) may be varied by gears and belts.

Friction. Very general, as a basis for electric resistance.

Mechanics of liquids. Flow of water through pipes as a basis for study of electric current; one is a flow of molecules through tubes, the other a flow of electrons through conductors, and the attendant phenomena are very similar. Study rate of flow as a basis for intensity of electric current. Study surface friction as a basis for electric resistance.

Water pressure and force pumps as a basis for the study of electromotive force. Pumps in series and parallel.

Mechanics of gases as a basis for the study of suction pumps.

Lift pumps, force pumps, centrifugal pumps, gear pumps.

Propellers and fans.

Heat. The distinction between heat and temperature.

Thermal expansion studied slightly, mainly to explain thermometer. Give nothing on specific heat.

Change of state studied rather fully, as bearing on fuses, solders, varnishes, and insulators.

Conduction and convection (very elementary) showing the relative thermal conductivities of substances used electrically, as bearing on electric conductivity.

Radiation studied more fully, as bearing on the radiation of waste heat from electric machines.

Calorimetry studied sufficiently to show the energy, nature of heat, and the ratio of heat and energy units, as bearing on electric waste.

Sound. Only such portions as bear on sound vibrations as affecting alternating currents, sounding disks, and electric oscillations.

Light. Omit practically all but photometry.

NOTE. Electricity should be omitted during first semester.

ELECTRICITY — SECOND SEMESTER [1]

This course should form a basis for the course in electrical construction to be given the following year; but it should be much broader, forming a basis for future work and study. The pupils should be taught not the details of apparatus and machines, but the principles underlying them, and in such a way that they can readily understand electrical devices thereafter and will have the inclination to investigate them. They should be so instructed that they will be able and willing to teach themselves after taking up practical work; emphasis, however, should be laid upon the principles that are involved in the work selected for construction.

The study at first should take up electric conductance and should use this as the guiding line until the end. Toward the middle of the course electric inductance should be brought up, and should go hand in hand with conductance to the end. Since, with pupils of this age, the mind is unable to grasp easily fundamental principles, these should not be made the basis of the work; but before the course ends every boy should realize that every electric phenomenon is a necessary consequence of the conductivity and the inductivity of electricity, and hence he should have a good grasp of the principles underlying conductance and inductance.

It should be shown that the conductance of electricity is simply a flow of small particles through the conductor, similar to the flow of water. Among practical workers this has been the view for many years, as indicated by the expression "juice"; and, finally, science has shown it to be the correct view. The subject should be stripped of its cloak of mystery, and should be explained in the light of the facts and definitions studied under physics. The similarity of friction and resistance should be pointed out; also of velocity and current; of elasticity and capacity; of springs and condensers; of inertia and inductance.

Omit static electricity altogether.

Omit the study of cells until all the simpler features of conductance have been considered. The flow of electricity through cells is a complex process. But one idea at a time should be considered, all incidentals, as far as possible, being omitted.

[1] Eight periods per week.

Quantitative experiments in this course in electricity should not be undertaken. The experiments should be of a qualitative nature, the exact facts being obtained from textbook or teacher, and then enough problems should be given to fix the facts and the methods of using them.

Show the effect of cells in series, in parallel, and in series parallel, because of the variations in force. Then, with cells of considerable resistance, such as Daniell's, show the effect with cells in series, parallel, and series parallel, caused by variations of internal resistance. But do not emphasize internal and external resistance too much until the pupils look at internal resistance in the same way as at any other resistance.

During these experiments teach the pupils how to connect up cells in combinations properly, according to the following: Wires should be crossed only when necessary. Connections should be firmly and neatly made. Cells should be symmetrically placed, like poles in corresponding positions, and wires should be symmetrically arranged, so that errors will be obvious and the battery will look well.

In this final set of experiments the wiring should be in all respects according to the best practice.

The general distinction between the voltmeter and ammeter should now be brought out, without studying their principles. Readings with each should be taken, and Ohm's Law indicated.

The idea of fall of potential should then be developed.

By suitable experiments the following should then be shown: The flow in any circuit is everywhere equal. The flow through parallel conductors is proportional to the conductance and inversely to the resistance. The force, or potential difference, is the same at the terminals of each branch. The difference in potential in any portion of any circuit is proportional to the resistance of that portion.

Explain the terms "voltage drop," "line loss," etc.

Second-class conductors should then be taken up.

Show either by lecture or individual experiments that the resistance decreases inversely as the cross section and directly as the distance, and with the degree of saturation, and varies with the material of the conductor.

Show the passage of matter with the current, and finally do some simple work in electroplating.

Study electrolysis with particular emphasis on underground effects on pipes, etc.

Take up the study of cells, particularly some dry cells, and Lelanché's cell in its common forms. Introduce the idea of polarization and its reduction. Then study storage cells.

Confine this study of second-class conductors mainly to mere facts, giving no theories or chemical processes. Remember that the materials of dry cells are moist or there would be no force.

Distinguish between these liquids and others.

Then take up third-class conductors or insulators. Show by lecture experiments that they are conductors in a slight degree. Show that in many cases the enormous cross sections and voltages, as with long cables, make considerable leakage.

Include oils in this class. The insulating properties of ordinary oils are in about the following ratios:

Melted paraffin, 8100; boiled linseed oil, 8000; turpentine oil, 6400; air, 1670; crude lubricating oil (mineral oil), 1600. These numbers give the disruptive strengths in volts per millimeter.

Bring out the effect of moisture on solid insulators, particularly in combination with dirt.

Take up a brief study of the heating effects of current on conductors as a basis for elementary study of lights, heaters, and fuses. Give problems on wire capacity.

Show that all conductors are heated by the current, and that this heat represents the waste, and is equal to I^2R. Consider lighting circuits.

Inductance. Using permanent magnets, show by the ordinary methods the simple laws of magnetism.

Show that a current passing over a compass needle tends to deflect it; that increasing the current increases the tendency; that wherever the needle is placed the tendency is according to the rule: "If the palm faces the current, with the fingers in its direction, the right thumb points toward the needle's north pole."

Show that turns increase the tendency, and that the law still holds true. Show that a coil acts like a magnet.

Bring out the fact that if the wire, and hence the current, doubles on itself, there is no effect.

Show that the material of the conductor is immaterial, but that the material of the inside of the coil affects the magnetic tendency enormously.

Bring out fully that a change in the current only is necessary to cause a magnetic change; but that a change is necessary.

All of this should be accompanied by simple problems in order to fix the facts and to show how to use them mathematically. Thus, the magnet pull in dynes is equal to the product of the strengths of the poles divided by the square of the distance between them in centimeters.

They will be able to do only simple problems, and those mechanically; but it will fix the law.

Study electromagnets.

Take up electric bells, telephones, and wire-telegraph systems in an elementary way.

Study circuit breakers.

Show experimentally the generation of electric pressure by passing a wire across a magnetic field. Show the increased effect by strengthening the field, and also by increasing the wires in series.

Show that it is necessary only to change the strength of field with reference to the wire, whether the wire moves or not.

The remainder of the subjects will need to be made very elementary.

Study alternators.

Show in an elementary way the peculiarities of alternating currents.

Study direct-current generators and then motors.

Without attempting to make the reasons all clear, teach the facts in reference to control of voltage and speed.

Study motor starters and voltage and speed regulators.

Study induction motors and methods of starting and controlling.

If possible, take up 3-phase currents.

Take up lighting circuits more in detail, showing the three-wire systems, the economy of high voltages, balancing of three-wire branches.

Electrical Construction

The first portion of this course should be devoted to wiring, beginning with interior wiring of a simple nature, such as bells, signals, and telephones. Next take up lighting systems and then power circuits, following with switchboard work. Then take up outside wiring as far as practicable.

The work should all be done in the best manner, strictly following the underwriter's rules in all cases. It should include all forms of molding, conduit, and insulation work that occur ordinarily, special attention being given to sweating and wiping joints.

The work, however, should omit all straight portions of much length, and should be confined to the difficult corners and connections.

The pupils should figure out the wire sizes and insulation and the circuits as far as possible.

The latter portion should take up the construction and study of some simple apparatus or machines, such as induction coils, transformers, or small motors.

Even a cursory reading of these notes will convince one that this is not a course in "high-school physics." One is forced to the conclusion that neither teacher nor pupil will find textbook

information or textbook experiments adequate to the requirements of the course. And this is indeed the fact, for it is only by utilizing the illustrative material afforded by actual electrical construction that the requirements of the course can be fully met.

And this leads us to the consideration of the shop or hand work of the school. It cannot be said that nothing corresponding to the "logical progression of exercises" remains, but the formal exercise has been practically eliminated. A real product is being made whenever possible, and it is being demonstrated more and more clearly that such work will furnish ample opportunity for all the practice necessary for the development of technique. It has further been demonstrated that this product, if wisely chosen, will also furnish the motive for a considerable portion of the theoretical work required in the course.

For example, the pupils are engaged in the construction of a number of motor headstock speed lathes adapted for both wood turning and hand metal work, and this one project has interested the teachers and the pupils in several departments of the school. The drafting rooms where the lathe was designed and where all the shop drawings were made, the pattern shop, foundry, machine shop and electrical-construction shop, the forge shop where sets of turning tools have been made, and the turning shop which has furnished the handles for these tools, and the classrooms and laboratories where the theoretical phases of the problem have been considered — these have all given their quota of help and have received in return their share of the vitalizing effect of the reality of the work.

The effects are seen in several particulars. It is needless to say that work of this type at once sets a standard of workmanship superior to that which obtains where the product has no practical value. The interest of each boy is widened, for while all cannot work on each part, the boys make everything about the lathe except the copper wire with which the motor is wound,

and every workman is interested in and more or less informed about the completed machine.

Such work has its effect even on the appearance of the shops. They look like real shops, well kept and orderly, but most of all *busy*. A spirit of industry pervades the place, rather than the military, "lock-step," time-serving uniformity which so frequently marked the manual-training schools of yesterday. The matter of "discipline" is reduced to a minimum; these are not schoolboys, they are young workmen.

An interesting attempt to put his work on a shop basis, as far as possible and for educational reasons, has been made by Mr. Albert G. Bauersfeld, instructor in pattern making. Efficiency records have been kept and comparisons made with commercial shops to ascertain the ratio of ability and of money value between the pupil and the professional pattern maker. Mr. Bauersfeld describes the plan as follows:

A card system has been used in the pattern shop, which preserves a complete record of the time of producing a pattern, the grade of workmanship, the amount of material used, and the amount wasted through the error of the student. Following is the card:

LANE TECHNICAL HIGH SCHOOL

EFFICIENCY RECORD

	MATERIAL	COST
JOB________	Wood________	
Date Begun________	No. Ft. in Job________	
Date Finished________	No. Ft. Spoiled________	
Total Hours ________@	10 cent Wage Per Hour________	
Workmanship________%	Total	________

Name

Room

Instructor

For the purpose of comparison a set of blue prints was submitted to the pattern-shop foreman of a commercial establishment for an estimate of the time it would take a professional pattern maker to produce the pattern for the several parts of the lathe. This estimate is tabulated below, together with data obtained from the pattern-shop record cards.

Pattern	Time for Professional Pattern Maker	Time for Student
	Hours	*Hours*
Front end plate and cover	19½	66
Rear end plate	9	48
Yoke	12	26
Bed	18	70
Leg	18	62
Tailstock	12	44
Tailstock cap	¼	1
Tailstock handwheel	5	12
Cross bar for tailstock	¾	1½
Eccentric clamp	1	4
Clamp lever	1½	7½
Frame for controller	2½	7½
Clamp plate	¾	7½
3 face plates	4	15
Tool post and core box	6	31
Tool-post slide	¾	4
Tool rest	4	18
Motor hand wheel	1½	7
4 small motor parts { commutator shells, brush holder, pole shoe }	10	23
Total	126½	452

A commercial job shop in Chicago generally estimates about 80 cents per hour for labor. To produce these patterns in a commercial shop, therefore, would cost $101.20 for labor and 10 cents per board foot for material.

By comparing the time required by the expert with that used by the students in producing the patterns, and by applying this ratio to the professional's price per hour, we find that a good second-year student is worth about 22½ cents per hour, or about $10 per week. A pattern maker's apprentice receives $6 per week during his second year.

The factor of waste material in the school workshop is necessarily much larger than in a commercial shop, for obvious reasons, and ranges from 25 per cent to 33 per cent.

The average student in a school pattern shop is able to make an acceptable commercial pattern which will produce a usable casting, though, of course, it will not be understood that his workmanship is equal to that of an experienced journeyman.

It should not be thought that the lathe is the only problem which has engaged the attention of the school. Nor should it be imagined that this newer spirit has been "introduced." Rather it has been "developed," and sometimes has been promoted by necessity. At one time it was necessary to start a new class in the machine shop, and there were no lathe tools and no available funds with which to purchase them. They were therefore made by the boys in the forge shop, and were found to be satisfactory, even if not equal to the product of the best makers. One thousand sets of these tools have been made for use in the school.

A lot of one thousand lockers is now being projected. The drawings are being made and the necessary jigs are being devised. These lockers will not only furnish excellent work for the boys, but will also entail a net saving to the city of over one thousand dollars.

Principal William J. Bogan has become so strongly convinced of the value of this real work that he has offered to undertake work for the elementary schools in his district, providing the projects are such as can be adapted to the educational requirements of the different courses of study which are being followed in his school.

The school has so few years to its credit that reliable conclusions can hardly be drawn from its statistics. It is certain, however, that many of its pupils would have attended no other type of high school, had this been wanting. It is possible that the school will not hold an appreciably larger percentage of its

pupils than high schools generally, but this should be interpreted in the light of the controlling motive of the school. This is shown by the following quotation from an address given by Principal Bogan at the dedication of the school, February 22, 1909:

"I often wonder what it is in our make-up as teachers that impels us to stand afar and gaze at our work through the telescope of tradition and precedent, which magnifies the importance of Greek and Latin and ancient literature, while we ignore the pitiful sight of mankind on its knees offering up the prayer in all its terrible literalness, 'Give us this day our daily bread.' On every side we observe the heartbreaking struggles of poverty-stricken parents to provide their children with a means of livelihood. The miner risking his life day after day and year after year beneath the surface of the earth, the washerwoman working over the tub until exhausted, and the seamstress illustrating night by night Hood's terrible 'Song of the Shirt' seem to lessen not our belief in the desirability of teaching the superficialities. On every hand we see parents wearing away their lives in toil in order that their children may have some of the comforts and a little of the education which they themselves have so sorely missed. To those of us who know that much of this labor is in vain, these struggles appeal with the force of tragedy. For years we have looked on this spectacle with more or less equanimity until at last the children, by their silent protests, by their repeated desertions, and by their pathetic failures, have borne in upon us the necessity for a great revolution in education.

Let us then loose the fetters of conservatism that bind us so closely to the schools of the past, and let us fairly meet the demand we can no longer evade."

CHAPTER XIII

THE TRADE SCHOOL

While it is felt by many that the technical high school is capable of such extension and of such close adjustment to individual needs that the trade school is not a necessary part of the public-school system, it is probable that, for some time to come, the trade school will fill local and immediate needs more effectively than the high school.

The trade school, usually open to boys and girls of sixteen years of age or over, without severe restrictions as to scholastic preparation, bears somewhat the same relation to the public technical high school as the intermediate industrial school bears to prevocational courses in the seventh and eighth grades of the elementary school.

Trade schools are intended to be markedly practical, and they devote a much larger percentage of time to the development of special skill and speed, and to the giving of actual shop experience in methods of production, than to the consideration of the related theory, knowledge, and art.[1] Such schools are "finishing" schools and prepare directly for some occupation. What the law school is to the future lawyer, or the normal school is to the coming teacher, the trade school is to the young man or woman who desires to become proficient as a skilled industrial worker.

The trade school being a finishing school, the pupil enters it only when he has definitely determined what occupation he desires to follow. In accordance with this conception, the trade school eliminates from its courses of study all irrelevant matter

[1] See Manhattan Trade School, p. 130.

in a way which the conservative educator feels to be ruthless and inconsistent with the aims of an institution which claims to be a "school."

The administrators of these schools, however, have realized that, to accomplish their primary purpose, they must have an eye single to it, and they have determined not to add to the already large number of young people who "know everything except how to earn a livelihood."

Within the past five years several public trade schools have been established or have been taken over by public-school authorities after having been successfully administered for a time under private control. Prominent among these may be mentioned the Manhattan Trade School for girls, New York City; the Philadelphia Trades School; the Milwaukee School of Trades for Boys, and the Milwaukee School of Trades for Girls; the Girls' Trade School, Boston; the Portland School of Trades, Portland, Oregon; the Worcester Trade School, Worcester, Massachusetts; and the State Trade School, Bridgeport, Connecticut.

The following description of the Milwaukee schools of trades is taken from a paper read at the 1911 convention of the Western Drawing and Manual Training Association, by Mr. Charles F. Perry, supervisor of industrial education, Milwaukee, Wisconsin.

MILWAUKEE PUBLIC SCHOOLS OF TRADES

The trade school for boys first opened its doors for pupils on January 2, 1906. It is thus in its sixth year. It was started under the auspices of the Merchants' and Manufacturers' Association of Milwaukee, through the initiative of Mr. Frederick W. Sivyer in his inaugural address as president of the above society.

He had been a member of the Board of City School Directors, and helped introduce manual training into the Milwaukee public schools. The trade school was conducted under these private auspices for one and one-half years. The child grew beyond the ability of its parent to care for it. Moreover, the development of the youth of a community into efficient citizens is

not the function of private individuals, but of municipal effort and taxation. Just as the kindergarten and manual training in these United States were created through philanthropic initiative and proved of value to the municipality before being adopted by it, just so will trade schools be established in this country.

The Wisconsin legislature of 1907 enacted a law making it possible for any city in the state, desirous of establishing trade schools, to levy a tax not to exceed one half mill for that purpose. Under private auspices the tuition charge was $10 per month, and the courses of apprenticeship were approximately one year in length.

The Milwaukee Board of School Directors took advantage of the new law, and on August 1, 1907, "The Milwaukee School of Trades" became "The Milwaukee Public School of Trades for Boys." Any trade school which is compelled to charge its pupils $10 per month for tuition precludes the very student who should be enrolled on its books. Placing it under municipal control made possible the supplying of two vital needs—free tuition for all students under twenty years of age, and sufficient time in each course for a student to complete a thorough apprenticeship. Under private auspices two manufacturing trades were taught, namely pattern making and machinist and toolmaking; and one building trade, plumbing and gas fitting. During the summer of 1908 another building trade was added, namely a complete carpentry and cabinetmaking apprenticeship.

The length of each course at present for each trade except plumbing is two years of fifty weeks per year, and forty-four hours per week, making the total apprenticeship 4400 hours. The plumbing trade requires one half of this time, or 2200 hours. If a student shows a special aptitude and can complete the required amount of work in less than the prescribed time, and wishes his diploma, it is granted him. In trade teaching, each pupil is a class by himself. He may advance as quickly as he pleases, consistent with the attaining of the required standard of the school in workmanship.

The hours of attendance are from 8 A.M. to 12 M. and from 1 to 5 P.M. daily, excepting Saturday afternoons and legal holidays. The school closes for vacation the last two weeks in July.

Tuition is free to boys who are residents of Milwaukee, and between the ages of sixteen and twenty. They are required to pay a material charge of $1 a month. Residents over twenty are required to pay $5 per month, which includes material charges. Nonresidents are required to pay $15 per month, which also includes material charges. Instruction is given in night classes four evenings per week from October 1 to April 13, two hours each evening, with charges as follows: residents between sixteen and twenty, tuition free, and 50 cents per month for material charge; residents over

twenty, \$1 per month for tuition and material; all nonresidents, \$4 per month for tuition and material.

In the boys' school the course of instruction in each trade includes the following five branches:

1. Shop practice and trade lectures.
2. Drawing
   - Mechanical drawing
     - Isometric
     - Working drawings
     - Problems in design
     - Architectural
   - Free-hand working drawing
3. Workshop mathematics
   - Shop arithmetic
   - Shop algebra
   - Shop geometry
   - Shop trigonometry
4. Shop-inspection trips — In connection with each trip a carefully written report must be submitted.
5. Practical talks and lectures on subjects connected with each trade, and topics fundamental to all trades.

Approximately one fourth of the student's time during his course is devoted to academic instruction incidental to his trade, and vitally essential to the first-class artisan whom the world needs and the school is endeavoring to develop, the remaining three fourths being spent in actual shop practice.

Up to April 1, 1911, the boys' school has sent out thirty-four graduates, subdivided as follows:

Pattern makers	12
Machinists and toolmakers	12
Plumbers and gas fitters	10

The average age of the above thirty-four graduates is $20\frac{2}{3}$ years. The average length of time since the thirty-four graduates left school is $11\frac{1}{2}$ months. The average rate of pay of the graduates upon leaving school is 26 cents an hour. The average rate of pay of the above young men at the end of $11\frac{1}{2}$ months is as follows:

Pattern makers	31.8 cents per hour
Machinists and toolmakers	32.6 cents per hour
Plumbers	53.2 cents per hour

or a general average of 39 cents per hour. These figures will compare favorably with those of the commercial-graduate apprentice. The cost per year of the trade-school pupil to the city is approximately four times the cost of the high-school pupil, but the trade-school graduate can command practically four times the wages of the nonvocationally trained high-school

graduate, and possesses equal possibilities for advancement with his high-school brother graduates.

The original law which made possible the establishment of municipal trade schools in Wisconsin, and which contained a section limiting the age of entrance to sixteen years, has been changed so that boys and girls may enter at fourteen. The Board of School Directors has taken advantage of the change in the law and applied it to the girls' trade school only. In the construction of the new municipal school of trades for boys, plans of which are at present in process of preparation, the outlook for a preparatory department which will care for boys between the ages of fourteen and sixteen, and who meet certain requirements, is very bright. This will aid materially in solving the most complex part of industrial education. There is at present a trade-school preparatory course added to the regular high-school courses, which permits the eighth-grade graduate to follow a good preparatory course until he is sixteen; but there are many boys who cannot reach or who do not wish to attend the high school, who will do excellent work in the trade-school preparatory department. This department should not be narrow, but should treat some of the upper-grade subjects, with which the boy has frequently found difficulty, from a new and more vital point of view.

Viewed broadly, the problem confronting those responsible for the administration of a girls' trade school is more complex than the one to be solved in connection with a similar school for boys. The future for the boy graduate is in a measure fixed; that is, he will remain at his trade and work upwards into positions of higher and higher responsibility, depending upon his ability and energy. He will always be in the ranks of earners. Not so with the girl graduates. More than half of them will have left their trade in a few years and become housekeepers in their own homes. They will be occupied many more years in the latter duties than at the trade they have learned. Realizing this fact, the Board of School Directors has wisely and with farsightedness arranged a course of study which will prepare Milwaukee girls to earn an efficient wage in a minimum time, and at the same time equip them for the household duties of the home-keeper.

The age of admission is two years younger than that of the boys' trade school, thus permitting them to enter the ranks of skilled earners at an age somewhat younger than the graduates of the boys' school. This is permissible on account of the less amount of personal risk in the trades which girls may learn, as compared to the dangers inherent in many trades popular with boys; and also on account of the laws which forbid boys under sixteen years of age working on dangerous machinery.

The total number of hours per week required of the girls is thirty-five,

or nine hours less than demanded from the boys. Instruction is given from 8.30 A.M. to 12 M., and from 1 to 4.30 P.M., with no Saturday morning session. The trades taught are dressmaking and millinery.

The dressmaking trade is divided into six separate steps, as follows:

Elementary sewing department.

Underwear department.

Children's department.

Shirtwaist and cotton-dress department.

Dressmaking department.

Custom-work department.

The millinery department is divided into two parts, the elementary and the advanced.

Supplementing the trade instruction is the following list of work required of all pupils:

Drawing.

Trade and workshop mathematics.

English, business correspondence.

Household science, including a thorough course in cooking.

Physical culture.

Shop-inspection trips.

Approximately two fifths of the student's time during her course is devoted to work supplemental to her chosen trade.

Several features are common to the administration of both schools. For instance, a special feature of all the classroom work consists in adapting it as nearly as possible to the special requirements of the various trades. A different class of instruction is given in mechanical drawing and workshop mathematics for each trade.

A good working knowledge of elementary mathematics is highly essential to the successful artisan, foreman, and forewoman, and a good course in this subject is given. While it is conceded that many other branches would prove of value to the students, it has not been deemed advisable to introduce them into the actual work of the schools; but the students are urged to supplement their practical work by as much outside reading and study as possible. They are urged to subscribe for some good trade journal along the lines of their chosen trade, and keep in close touch with the latest and best methods of trade practice. It is also urged upon them to start a library of their own. The world has excellent facilities of self-culture for the ambitious and industrious youth. Wisconsin offers the opportunities of university extension work. The advantages to be obtained by continuation work in the city night schools of both grammar and high-school grade are carefully impressed upon the graduate of these schools.

It is not the purpose of the school that its graduates shall be merely skilled artisans; it is intended that they shall be not only trained and efficient but intelligent workmen, desirous of making the most out of themselves in their chosen vocations from every point of view.

Each student receives personal attention and instruction, and no student is held back on account of the slowness of other pupils. Careful attention is paid to the formation of neat habits of work in each student, and only the best methods of procedure are taught. All work is done from drawings, and no problem either in classroom or shop, that does not have a practical application, is given to a pupil. Theory and practice are closely related all through each apprenticeship. It is the purpose of the school to surround the students by the best possible environment and atmosphere. Habits of punctuality are encouraged, and the value of the possession of a good trade is impressed upon the students.

It is also the aim of the school to secure instructors who are specialists in their line, men and women who are interested in the work, and who can impart their knowledge and experience to apprentices.

The class of work given to the students is carefully planned to be as nearly as possible of equal educational and practical value. Thus the student's interest is aroused and held. A high standard of workmanship is demanded from every student, and only those attaining it are permitted to graduate.

The night classes are planned principally to supplement the experience of apprentices and workmen who are employed during the day at the trade in which they desire advancement under night instruction. The total day instruction of the two-year courses requires forty-four hundred hours. The total night instruction of one term of thirty-one weeks at eight hours per week amounts to two hundred forty-eight hours. Thus it is evident that none but students of exceptional ability and determination could expect to serve the entire school apprenticeship in night classes only. The school does not advise students to attempt to learn a trade by this means.

It is impressed upon students all through their course that success and happiness are not measured by money alone, but by the knowledge and experience of work well done.

The schools do not claim to turn out experienced workers or journeymen. The aim is to instruct the students thoroughly, in as short a time as possible, in all the fundamental principles and in the practice of the trade in question, so that they may, upon graduation, possess ability and confidence, and be of immediate and practical value to their employers and receive a fair remuneration at once. Speed and efficiency as commercial employees should soon follow.

THE DAVID RANKEN, JR., SCHOOL OF MECHANICAL TRADES,[1] ST. LOUIS, MISSOURI

Another school, somewhat different in type but professing reliance on the efficacy of specialized and intensive trade training, is the Ranken School of St. Louis. This school offers courses in carpentry, pattern making, bricklaying, plumbing, painting, and steam engineering to boys of fifteen years of age or over, who have completed the work of the sixth grade, or who have an equivalent education. The school is in session seven hours a day (three and one-half hours on Saturdays), for ten and one-half months of the year. The classes are taught by men who have a thorough and practical knowledge of their respective trades. The work is confined exclusively to the specific trade and to the drawing, mathematics, and, in the second year, the science of that trade. During the first year the weekly program provides for twenty-eight and one-half hours shopwork, six hours drawing, and four hours mathematics. The school is therefore a typical trade school.

The David Ranken, Jr., School of Mechanical Trades was made possible by the generosity of the donor, whose name it bears, its liberal endowment making it essentially a free school; for while the tuition amounts to $30 a year, the actual per capita running expenses average six times that amount. The foundation deed of the institution bears the date of November 29, 1907, and the school opened its doors to pupils for the first time on September 7, 1909, with twenty students in attendance.

The purpose of the school is clearly shown by the following quotations, the first from the foundation deed, and the second from the 1911 report of Superintendent Lewis Gustafson.

> Whereas for many years I have been impressed with the fact that too little attention is given to the instruction of boys in the mechanical trades, and that the public schools and other free educational institutions have a

[1] From an article prepared by the author for *Vocational Education*, January, 1912.

tendency to create in the minds of the young, as well as in the community, a prejudice against manual labor, and the idea that common work is not respectable, so that a false impression and a false pride often influence boys and young men to avoid the mechanical trades in which they might have succeeded, in order to follow pursuits for which they are unfitted and branches of business which are overcrowded and in which they probably would not succeed, I am satisfied that there is need of an institution the object of which shall be education and instruction in the ordinary mechanical trades and in which boys, especially, may be taught the dignity of labor.

The aim of the Ranken School may be summarized as the training of efficient mechanics who shall take a pride in the proper performance of their work, and who shall have such knowledge and such skill as will enable them to meet intelligently whatever demands that work shall lay upon them. While it is not the aim primarily to train foremen and superintendents, it is the expectation that within a few years after graduation many of the students, by virtue of the training they have received, will be enabled to rise to positions of responsibility, or go into business for themselves.

It should be observed that while the school is undoubtedly ambitious for its future graduates, it plans to fit them for the higher positions, if at all, only by enabling them to rise from the ranks through successful work. On the other hand, it teaches no trade which is not open at the top; which does not, in other words, consist of work which is in itself educative because it combines thinking with action. As fairly illustrative of all the courses we may examine in detail the work offered in carpentry, as outlined in the catalogue.

COURSE OF STUDY IN CARPENTRY

The instruction offered in this department aims to cover thoroughly the work of the carpenter and joiner, with particular emphasis on housebuilding. Students work from drawings and blue prints throughout.

SHOPWORK

First Year

First term. Names and uses of tools, with instructions as to their handling and care; exercises in joinery.

Second term. Joist framing and setting; bracing; spacing; practical use of joinery exercises in framing sills, plates, girders, and ties, and fitting

in braces; use of nails, bolts, stirrups, and camber rods; machine planing, sawing, and working moldings; tool grinding; setting up machines.

Third term. Making window frames, sash, doors, blinds, and various kinds of moldings; paneling; millwork in general.

Second Year

First term. Roof framing; cornice setting; shingling; making and setting centers, columns, and supports; interior finish, such as jamb casing, baseboarding, fitting and hanging doors and transoms, and setting ceiling beams; putting on hardware.

Second term. Cabinetwork; building stairs, handrail, ramps, and easings.

Third term. Erecting complete buildings and full-sized sections of buildings in the school shop.

Lectures. During the course informal shop lectures are given on such subjects as the following: the proper care of edged tools; the various woods used in building, and their proper selection and treatment; the measurement of lumber; glues, nails, screws, bolts, nuts, pins, straps, and other fastenings; framing, shoring, and underpinning; roofs, trusses, spans, and beams; stair building; woodworking machinery; paints, shellacs, and varnishes; fire-prevention devices; the steel square; building ordinances of St. Louis.

Third Year

An additional year of instruction in roof framing, roof trussing, stair building, and cabinetwork is offered for those who have completed the work of the two-year course, or its equivalent. Students in this third year will be permitted to specialize at the discretion of the instructor.

Supplementary Instruction—Applied Mathematics

First Year

First term. Arithmetic. Fractions, decimals, squares and square root, cubes and cube root, areas, volumes.

Second term. Elementary geometry. Chiefly the measurement of angles, chords, and arcs; areas of triangles, rectangles, circles, and irregular figures; cubic contents of tanks, bins, cylinders, cones, and other bodies; percentage, proportion, discount; English and metric systems of weights and measures.

Third term. Formulæ. Simple fundamental processes involving one or two unknown quantities, in so far as these are necessary in the handling of formulæ commonly found in handbooks and books of reference for trade workers, or in the solution of useful geometrical problems; practice in working problems by formulæ.

Second Year

First term. Mechanics. Problems involving the laws of the lever, wheel and axle, inclined plane, screw, wedge, etc.; expansion and contraction of solids, liquids, and gases; water pressures, flow of water through pipes; horsepower of pumps and engines, friction, etc. (In connection with work in applied science.)

Second term. Elements of plane trigonometry. Simple problems involving the measurement of angles, slopes, oblique forces, wind pressures, resultant of forces, inaccessible heights and distances, etc. Problems arising in the use of tape, transit, and level.

Third term. Devoted to the solution of problems arising in science building construction, etc.

Special emphasis on measurement of lumber, area, and cubic contents; and on geometrical problems involved in roof framing, stair building, and the use of the steel square; estimates.

Drafting

First Year

First term. General use of drawing instruments; free-hand lettering and sketching; geometrical problems relating to the trade; joinery exercises.

Second term. Details of fences, sheds, and stables; joist framing; studding; girders and trusses.

Third term. Scale and full-size details of window frames and sash; door frames and doors; details of stairs and interior finish.

Second Year

First term. Plan reading and preparation of working drawings; city building ordinances.

Second term. Working drawings consisting of $\frac{1}{4}''$ scale plans, elevations, and sections of houses and cottages, with $\frac{1}{2}''$ details.

Third term. Tracing and blueprinting; specifications; taking off quantities.

Applied Science[1]

First term. Applied physics. Properties of materials used in the trades; force in its various forms; levers, booms, derricks, and hoists; study of ropes, timbers, boilers, pipes, and joints when under stress; holding power of nails, screws, glued joints, cement, and mortar; bearing power

[1] Given in second year only.

of soils; wind pressure and snow loads; water circulation; expansion of pipes, etc., due to heat.

Second term. Applied chemistry. Chemical elements and their general properties; water impurities; oxidation, rust, corrosion; heat; combustion; study of gas and steam; acids and their action; study of materials, such as oils, cements, mortars, wood, brick, and tile, and the various metals used in the trades; deterioration of materials from the action of gas, heat, moisture, and frost.

Third term. Continuation of first and second terms. Practical methods in building measurements; practice with the builder's tape, transit, and level; mathematical problems based on these measurements; building construction and city ordinances.

Brief statements of the other courses follow:

Pattern making. Pattern making covers architectural and machine pattern work, and includes the making of patterns for pipes, columns, panels, stair work, pulleys, flywheels, steam cylinders, engine frames and beds, and spur, bevel, and worm gears.

Bricklaying. Through a graded series of examples practice and instruction are given in such types of bricklaying as the workman is sure to need in the erection of buildings.

Plumbing. The course in plumbing is planned to meet completely the needs of the practical plumber.

Painting. Instruction in painting includes house, sign, and fresco painting, and aims to give ability to plan appropriate schemes of interior and exterior decoration, and to furnish the necessary technique of the practical workman.

Steam engineering. The course in steam engineering aims to give a complete practical and theoretical knowledge of the duties of the stationary engineer. It involves the daily operation of the school power plant, and the visits to other power plants and to factories.

A study is made of fuels, the chemistry of combustion, and the construction of boilers. Consideration of pumps, steam engines, steam turbines, gas engines, valve setting, gauge reading

and testing, motors and electric lighting, is included in this course. Elementary machine-shop work is also given.

The courses are planned to cover a period of two years, with the possibility of special advanced work on their completion. Progress through the courses, however, varies with the individual.

During the second year, instruction is given in applied science in all courses, and informal shop lectures are given for the purpose of broadening the outlook of the pupils.

Equipment. The physical equipment of the school is adequate to the subjects now taught, and most of the work done is of a thoroughly practical nature. On the other hand, it should be stated that a fundamental principle of the school is to give what may be called intensive training in the technique of the trade, eliminating almost entirely the commercial product, interest in which, it is thought, might possibly divert attention from the legitimate business of the school. Thus, while men are taught, in the carpentry class, every phase of frame-house construction, the building erected by the pupils is, nevertheless, an incomplete, temporary structure, being torn down at the end of the year. It is claimed that the work of wrecking the building contributes to the education of the pupils, as they are taught to demolish the work with the least expenditure of time and the maximum saving of material, and because carpenters are constantly required to do this kind of work.

It may be said, parenthetically, that in this particular the school shows a marked variation from the type. The superintendent, however, maintains that the school occupies a middle ground; it proposes neither to duplicate the general educational work of the high school on the one hand, nor to become an industrial plant on the other. It is a trade school, but it aims to make trade instruction contribute to the mental, moral, and social well-being of the boy, by utilizing every available hour in the doing of *new* work requiring close application and constant

intellectual reaction. The school believes in the dignity of work, the educative value of combined thinking and doing, and the cultural value of efficiency, whether manual or mental. It is safe to predict that it will not be deflected from its avowed purpose, either by the glamour of traditional educational ideas regarding the superiority of pure science, pure mathematics, and pure design, or by the attractions of the commercial-product system.

Enrollment. The membership of the school is not at present large, but it is constantly increasing. The writer called at the school on the opening day in September and found 82 students in attendance, about evenly divided between former pupils and those enrolling for the first time. The attendance on the fourth day of the term was 96, an increase of 21 over the figures for the corresponding day last year. By the beginning of the second month the enrollment of regular day pupils had reached 122. This enrollment, which, by the way, includes 25 from outside of the city and 5 from other states, will undoubtedly increase materially.

The members of the day classes appeared to be younger than one expects to find in a trade school. Boys are admitted at fifteen, and the average age seemed not far beyond this mark. The graduating class of 1911 numbered 18, and the ages of these boys on entrance, the distribution among the several trades, and their previous schooling are shown by the following table:

AGE AT ENTRANCE — GRADUATING CLASS OF JULY, 1911

Ages	Carpentry	Plumbing	Steam Engineering	Painting	Totals	Schooling				
						Elementary Grade			Year in High School	
						6th	7th	8th	1st	2d
15–16	3	1	2		6		1	2	2	1
16–17	1	1	1		3	1	1	1		
17–18	1	4		1	6		2	2	2	
18–19	1	2			3	1		2		

In addition to the day classes there is a large evening school, in session four evenings a week from October to March inclusive, designed to meet the needs of mechanics, either journeymen or apprentices, already at work in the trades.

There is also a coöperative course for apprentices in the machinist's trade, fifty of whom receive instruction in drawing and mathematics two mornings a week. The tuition is $5 a term, or $15 a year, and is paid by the employer, who also permits the apprentice to attend without loss of wages. All arrangements are made in accordance with an agreement between the school and the St. Louis branch of the National Metal Trades Association.

The enrollment in all classes for the school year 1910–1911 was 159 regular day pupils, 58 metal-trades apprentices, 248 night-school pupils; total, 465.

Outlook for the future. A school which has been in existence but two years should be judged not so much by its present accomplishment, however noteworthy it may be, as by its hopes and plans for the future. The school as it stands at present is apparently but the beginning of a highly diversified institution. The beautiful and commodious building which it now occupies is but one of a group of buildings now quite definitely planned, and the additions already contemplated will cost in the vicinity of $250,000. New subjects will be added as soon as demanded by the constituency of the school, and it is expected that plans will be made for reaching the boy of fourteen, and for enriching the more elementary trade courses, to be provided for him, with some general educational work.

The location is thought to be ideal. Recently several industrial plants have been built in the vicinity, replacing former dwelling houses. It is expected that in the near future the school will be the center of a district which is both industrial and residential, containing the homes and the workshops of a population which

the school can effectively serve not only vocationally but socially as well. It is toward the ultimate fulfillment of this larger purpose that the school is being steadfastly developed.

The Worcester Trade School, Worcester, Massachusetts

This school is chosen for description because it differs from those already noted in the emphasis which it places on the "product system" as being fundamental to its methods of instruction.

The school was opened in 1911 with the avowed purpose of training thoroughly skilled and competent workmen. Established under the laws of Massachusetts, it is supported jointly by the state and the city of Worcester, and is controlled by a Board of Trustees, elected by the City Council and acting as agents for the state.

Occupying a building especially erected and equipped for the purpose of providing adequate training for machinists, pattern makers, carpenters, and cabinetmakers, it is one of the most effective trade institutions in the country. Specializing in but few trades, it applies itself with great thoroughness to the accomplishment of its purpose.

The school is in session from 8 A.M. to 5 P.M. on five days a week, and practically for the entire year, or, to be exact, for four terms of twelve weeks each.

Fully one half the time is spent in productive shop work; that is to say, in manufacturing a product which has a definite commercial value.

The remaining time is devoted to training, but not to instruction in book work alone, for considerable attention is given to the study of shop processes and in gaining additional information about and special practice in the technique of the trade.

Skill, speed, and appreciation of industrial demands, which are the requisites of the skilled workman, are gained by doing the commercial work.

In an article in the November *Vocational Education*, entitled "The Commercial School Shop," Principal Elmer H. Fish discusses fully this feature of the Worcester Trade School, and the following is quoted from that discussion.

ADVANTAGES OF COMMERCIAL WORK

The principal purpose of this paper is to discuss the commercial-shop idea as it applies to industrial schools, that is, to the practice work of a school.

Briefly the arguments for the commercial work are these: First, interest; pupils are more easily interested in something of use. Second, thoroughness; it is much easier to insist on accuracy of workmanship when the product must meet commercial conditions. Third, speed; speed can be gotten without crowding when a comparison can be made with commercial practice. Fourth, efficiency; pupils are capable of doing a large amount of work. Whatever effort they put forth should result in the largest possible return to society for its investment in their education and training.

Opposed to these considerations are: first, the danger of exploiting pupils through too great desire for a good financial showing; second, the danger of antagonizing competing manufacturers by the invading of a private market by a public corporation; third, the danger of antagonizing labor in the same way. It may be of interest to discuss each of these arguments.

Interest. It is difficult for the average man to interest himself in the abstract. Shopwork which is not a part of a valuable product is abstract. As a matter of experience I would say that the average boy of sixteen years of age will get four times the training from chipping a slot in a tool post for a lathe that he would get from chipping the same amount of steel that is merely to be used again and again until it is all gone. On the other hand, abstract exercises have their disciplinary value; as, for example, a boy who chips carelessly on a tool post can be brought to a realization of his sins by being relegated to a block of steel until he is ready to be careful.

Thoroughness. We have found a very great value in the fact that work sold is inspected by outsiders who have no acquaintance with pupils or their troubles. We are fortunately all human and humane. After we have seen a boy struggle with a difficult job, watched him through the valley of despair, and finally seen him win out, it is hard for us to reject his work for a trifling

error that he probably would correct at the next attempt. Here the outside inspector comes to our aid by calmly rejecting the work for the very simple reason that it is not right. The disciplinary value of this inspection and its realism are two of the most potent factors in the imparting of experience to pupils.

It is not wise to do as is occasionally done — sell "second-quality goods" at second-quality prices. The scrap heap may be large, but it will inevitably be found that boys can and will, save for occasional lapses, turn out as good work as is distinctly and firmly demanded.

A small proportion of work actually sold will serve to set a standard for a considerable quantity used in the school. Of course no school ought to buy what it can make, provided the making is in line with the training which it is desired to give. An excellent expedient during the period of the equipment of a school is to make machinery in larger quantities than is needed and exchange the surplus for other equipment. The work offered in exchange must then pass the inspection of the market.

Speed. Modern conditions have little use for a man, no matter how skilled, whose production falls below a reasonable speed. In fact it is easy to show that a shop having a considerable overhead charge to meet might easily become bankrupt through the employment of slow workers, even though they were paid no wages at all.

Such being the case, it is desirable that graduates of industrial schools should be, if not rapid workers, at least trained to know what pace they must set to hold a position. The use of commercial work is especially valuable in this connection because it affords a real basis of comparison. For example, a boy was turning up brass bushings, for which we received 2 cents each, averaging an hour for each one. After being shown that at that rate he was worth 2 cents an hour minus the overhead charges of the plant (about 15 cents per hour), or about 13 cents less than nothing, he began to see ways in which he could increase his production. Of course it would be possible to estimate time on exercise work, but estimates do not have the same effect on students that the actual facts do, nor are they so likely to be correct.

Crowding pupils to get speed is dangerous on account of the possibility of exploitation. Speed should be attained solely for the good of the pupil, not for the sake of getting work out of the shop at a given date, except in cases. This is a most difficult thing to show to the manufacturers from whom work is obtained. However, it will not do to take outside work on close delivery dates. It is better to have none at all.

Efficiency. So far as the pupil is concerned, efficiency has been covered in the previous paragraphs. As affecting the community, it must be admitted that the taxpayers are entitled to the most economical administration

possible, consistent with the best training. In this case the two things are entirely consistent, inasmuch as the best training for other reasons involves a usable product, which in turn helps to reduce the cost of running the school. Then, too, waste of time and energy is always regrettable. To put boys or girls to work, performing what might be useful operations, on useless product seems so far from the reasonable, normal thing to do, that no one would consider it except for the imaginary obstacles of the opposition of labor and capital, which will be discussed later.

DANGERS IN COMMERCIAL WORK

Exploitation. As stated above, there is a wonderful amount of potential energy in a fourteen- or fifteen-year-old boy. Under proper direction this can be turned into a large amount of valuable work. The conditions which bring forth the largest amount of work are not the best for the training of the pupil. There must be a balancing of one against the other, so that the maximum of efficiency in the education and training of the boy shall be attained with the greatest possible efficiency in production.

A school in the formative stage, as most schools are to-day, will find this difficult, because it will be necessary to do many jobs by inefficient methods, since beginners should be taught to do work by purely shop methods in distinction from factory methods. For example, a boy may very well be taught to drill to a scribed circle when modern methods would dictate that he should do the work with a jig. The latter method of drilling might be desirable after the school had acquired a class of boys in their third or fourth year able to make their own jigs.

The danger of exploitation may readily come about through politics. The expense of conducting industrial schools appears to be necessarily greater than that to which the public is accustomed in other secondary schools. In order to get the political body which governs the finances of a city to establish a school, it is very easy to claim that the productive element may be pushed so that the cost may be as low as that of other secondary schools. It would also be possible to claim, and the claim could be made good, that, with a picked group of boys and a school with several hundred pupils and teaching a selected group of trades, the schools could be made self-supporting.

It is easy to see that a school which is self-supporting is something besides an educational institution. Such an institution, which could also pay its pupils wages, might be the best possible solution of the problem; but so long as it cannot pay wages it must be borne in mind that the largest expense to the community lies in the loss of wages which the pupils might

otherwise earn. This is offset later by the increased earning capacity of the pupils, but the loss is a present one and falls on the parents, who are usually ill prepared to meet it.

The average boy could easily earn a thousand dollars during four years. The cost to the community of a four years' course in a trade school ought not to be over $600. The resulting gain in worth of the boy's time perfectly justifies the expenditure of the $1600. The city is amply able to invest its $600 and wait for the return; but parents, as a rule, are not able to invest the $1000, certainly not the parents of the boys who most need this training.

Under these circumstances it is the plain duty of the school to see to it that the least possible amount of the pupil's time is wasted consistent with his health and the right of his parents to a reasonable amount of his services.

Labor. This brings us into apparent conflict with another possible objection, the labor element. This has, to many minds, been the great bugbear of the whole movement. In fact it has been so feared that no one has apparently taken the trouble to inquire into its real attitude. By labor element I mean not organized labor alone, but that twenty times larger body that votes on civic matters.

We have found in Worcester that this element wants two things: first, that everything that we do shall be open to anybody's view at any time; second, that we shall really teach a trade and do it thoroughly. They object to our turning out "half-baked" mechanics to compete for employment with men who know their trade. In this I believe they are right. At present they are judging the efficiency of the course by its length, which is perhaps the only way in which they can judge it until our graduates have been out a few years.

The manufacturer. The objection that competition with manufacturers may antagonize them is also an imaginary one. We have had more difficulty in keeping local manufacturers informed that we were in existence than we have had in avoiding competition with them. The amount of work required in any community to keep a trade school supplied is not likely to be more than a single day's work in a year for the shops in the same trades. We have had loyal support from local manufacturers from the time that they became convinced that we could and would turn out good work.

After following so far, the reader who is actually engaged in solving the difficulties of a trade school will ask, What commercial work can we get that is practical and practicable? In answer to this question I can only tell what we have done and what we are aiming to do in Worcester. The success that we have so far met with in our efforts in this direction is sufficient to convince us that we can carry out our plans in the future.

Our work so far is confined to machine work, pattern making, cabinet-making, and carpentry; therefore I shall confine myself to these trades. In reviewing the work I wish to say that we by no means abhor exercises in their place.

THE PLACE OF PRACTICE EXERCISES

Outside the scope of industrial education — in art, in music, in commerce, in law, medicine, and religion — it has already been found that a close approximation to the methods followed by the best artists, musicians, accountants, lawyers, etc., in their practice is the best way to follow in the practice of the schools. This practice is of course accompanied by instruction, but that is another subject. On the other hand, in many trades, arts, and professions the training of hand or eye is aided by practice which is in the nature of exercise, and which may not have commercial value. Years ago a blacksmith's apprentice was set to forging horseshoe nails, not because they could not be bought, but because in this work he spoiled less stock in acquiring facility with fire and hammer than in any other way. He practiced making welds on worthless scraps of iron until he could make welds with certainty. The same is true of most trades. The necessity of practice is evident, but the loss of material in commercial work spoiled is equally evident. When hard-headed business men resort to this expedient, we can hardly refuse to consider it, provided we consistently use it as a means and not as an end.

Conceding a limited amount of practice work given the pupil, we can say to him that he shall have practical work as soon as he can demonstrate his ability to do it without excessive waste; then it becomes necessary to provide that practical work, and in logical sequence, though this logical sequence may vary with every boy and is at best a matter of judgment with the instructor rather than something that may be laid down beforehand.

Speaking in the light of experience, I should say that commercial work is very readily found for the machine shop, with more difficulty in cabinet-making, and with still more difficulty in pattern making and carpentry. Taking these things in reverse order, we begin with:

Carpentry. By this we mean house framing, setting of door and window frames, sheathing, shingling, etc., as distinguished from inside carpentry, house finishing, or cabinetwork. Our work along this line resolves itself into the building of frames for garages, cottages, etc., of commercial sizes and of commercial stock, which when completed may be taken down and sold for a trifle more than the price of the stock; or, if no purchaser appears, may be re-used by the next class to construct a building of somewhat smaller size.

Only enough sheathing is done to enable a window or door frame to be set, inasmuch as that work is unskilled work and is often done by laborers. Shingling and clapboarding under these conditions must necessarily be torn down and the time and a large part of the stock wasted. Shingling is never done in shops, but only in the field. Therefore we shall have to send our boys into the field to give them commercial work. So far we have only been able to see a possibility of this through half time or other form of coöperation with local employers.

Pattern making. The pattern-making industry is peculiar in that it is exclusively custom work. But one pattern is made of a piece except in metal pattern making, which may be classed for purposes of instruction as machine work.

Ostensibly to treat all students alike, and as a matter of convenience to the instructor, it is usual for schools to have each pupil make a pattern for every job that is brought into the shop, and it may be necessary to follow this idea to an extent, especially at the start.

Pattern making also has the same peculiarity as tool, jig, and fixture making, in that it is a means to an end rather than an end in itself. A pattern is a tool which a molder needs in order to produce something of value — a casting. It has no intrinsic value and cannot be sold in the open market. Therefore no one can make patterns for sale except on order. Taking orders for patterns is difficult because few people will order from jobbing shops except for rush work. A little work may be obtained from friendly shops in the nature of replacements of worn-out patterns, but this is entirely unclassified and must be taken, if taken at all, as it is offered. The best solution of the problem of commercial pattern making that we know of is to run it in connection with the machine shop and drafting room. A machine-shop course, as will be seen later, is a very flexible thing.

It is possible for a shop to continue year after year bringing out new machines or new designs of old machines, which in time produces work of a highly desirable nature for both drawing room and pattern shop. By having a large amount of work of this nature under way in the drafting room it is possible to pick jobs which shall follow one another in logical sequence, and with as small steps as may be necessary between them for the individual pupil.

It should also be borne in mind that the nature of the pattern-making trade does not make it necessary that as great an amount of practice should be given as in most other trades. The actual making of a pattern after it has been designed is a comparatively simple matter. The study of the design of patterns, working from the drawings of the machine for which the patterns are to be made, is the largest part of the trade and the part

which should receive the most attention. The method here outlined is logical and in line with shop practice, in that the drawing room and pattern shop are tributary to the machine shop.

Cabinetmaking. This trade in its highest form is also custom work, and includes furniture and interior finish for houses, stores, offices, etc. However, there is an abundance of work of a simple nature that is made in large quantities. In commercial shops this work is done on special machines with an astonishing rapidity which cannot, of course, be duplicated with advantage by our pupils.

This work can be drawn largely from furniture lines, particularly drawing-room furniture, for bench work; and from such work as spool and bobbin manufacture, handles, banisters, dumb-bells, Indian clubs, etc., for lathe work. It will be found that most of this work returns only the cost of stock, inasmuch as it competes with work done in the West, where lumber is cheaper than here, and the difference in freight between rough stock and the finished article often covers the cost of labor.

We have done as yet very little of this work in Worcester, because of the press of work for our own equipment.

We have contemplated a full set of furniture, well made, of low-price wood, and of artistic design, which last we are assured of by the hearty coöperation of the Worcester Art Museum. It is our intention to put this line on the market through all local stores that are willing to handle it at a uniform price and terms. We shall probably begin with the mission style and later develop the more elaborate types, since the latter are required to give varied practice.

Machine work. This is essentially repetitive except in model and die making and in the manufacture of special machinery. The methods in vogue for production in large lots and in single units are not especially different in principle though they may vary in practice. Machine work may be divided into (1) preparation of work for machining; (2) machining; (3) erecting.

(1) Preparation of the work. This includes deciding upon the operations to be performed, their order, the best machine in which to perform them, the laying out of the work, the setting it up on the machine, the grinding and setting of cutting tool, and the adjustment of speeds and feeds. This work varies in difficulty from the simple centering of short round stock to the setting up of complicated castings on planer or boring machines. In this connection we are trying, in Worcester, to adapt the best of scientific management to our needs. In doing this we are having the older boys work up standard practice sheets. These will ultimately cover everything that we do in the shops, from cutting off and centering the stock to its final assembling. They are being based, in the first instance, on the judgment of

the boy, tempered by that of the instructor, and later revised in the light of experience.

These standard practice sheets will be followed only until better ones are produced. They represent at no time the ultimate goal, but at all times the latest experience of boys and instructors. These sheets are made during what we call shop-instruction time, which occurs in the recitation week, it being our endeavor to put all instruction of whatever nature in that week and leave the shop week for the gaining of experience. In carrying out this latter part of the scheme we shall use the standard practice sheets as a guide to the students and a help to the instructors.

(2) *Machining*. The classification of the chart shows many varieties of machine operations, practically all of which should be familiar to every boy. About half of these operations are found in the courses of manual-training and technical schools. They are generally looked upon by the school men as constituting the whole trade, instead of merely being one half of a small third of that trade.

The process of finding work of commercial value, either for sale or for equipment, which shall cover all these operations is really simple. As we get farther on in our work we are less and less inclined to think that it is essential that we avoid competing with local manufacturers. In fact we find that they are quite generally willing to coöperate with us. Among the possibilities of manufacture which avoid local competition we have found: sensitive radial drills; electrically driven drills, grinders, etc.; valves; special steam and water fittings; flanges, etc.; vises, pattern and machinist's; lathe chucks, universal and plain; drilling-machine vises; hand milling machines; profiling machines.

We have found the following manufactures entering into competition, but unobjectionable: handles for machines; change gears for lathes; tool posts for lathes; handwheels; stock sizes of cast-iron pulleys; collar screws; collars for shafting; lathe centers.

Machine tools and woodworking machinery for equipment of schools enter into deliberate competition.

We are now working on a hand milling machine, which we have designed in such a way that almost every one of these classified operations is possible in the course of its manufacture, although to get all these it will be necessary for us to make some parts by two different methods, one of which will be a better method than the other. This we do not consider objectionable, inasmuch as we feel that a boy who has been allowed to do work solely in the "best way" would inevitably fall into some of the worst ways of doing work when thrown on his own resources after graduation, much to his and our discredit. By this I mean that a boy who has always been guided is not

thereby taught to guide himself — that unless he has at least had an object lesson in the poor ways of doing work, he will try them when he is placed on his own responsibility.

MANUFACTURING PLANS

We have no intention of confining our efforts to the manufacture of any one machine, but intend to conduct our work along these lines:

9 weeks per year lathe work.
3 weeks per year planer work.
3 weeks per year milling.
3 weeks per year vise and erecting.
6 weeks per year drilling, grinding, engine room, and cleaning castings (one and one-half weeks each).

We believe that each boy should go around the circuit of these processes once each of the four years, so for these years we must provide work of suitable difficulty. It will be seen from this that the character of the work which we can do must vary as time goes on, until we have run the school four years; and it will also be seen that the amount of exercise work used in training may be expected to decrease as the larger variety brings with it a greater amount of simple work.

We have so far followed our methods through the first eighteen months of a four years' course. While it is impossible to say how they will work out, we can say that 75 per cent of the boys who entered over a year ago are still with us, as against 55 per cent for the local high schools and 63 per cent for the country at large. We have turned out in the vicinity of five thousand dollars' worth of commercial work, counting equipment of salable quality and work in process.

In conclusion let me say that our idea of a logical course in machine work covers:

(*a*) A line of small machinist's tools, involving a very small outlay for material and consequent small risk of spoiled work and difficulty of sale. This work is especially for beginners.

(*b*) Jobbing for local shops. This we shall have to confine to overflow work, and we must drop it in dull times. There are two large values in this work which make it attractive: (1) The fact that it is inspected by men who are acquainted with our boys and have no interest except to see that the work is right. (2) It brings local manufacturers into close touch with us and our work. On the other hand, we do not want to make this a large part of our work, because it must be done to a considerable extent when it is wanted, regardless of whether it best meets our immediate needs or not. A quarter of our work can be of this nature without harm.

(*c*) Making of equipment for ourselves, and, we hope, by a system of exchange, for other schools as well.

(*d*) The manufacture for the open market of (1) some light, fine machinery; (2) medium-weight machine tools or engine work; (3) rather heavy rough work, such as is offered by the local demand for rolling-mill machinery.

(*e*) Jig and fixture work in the last year of the course.

The last of the three divisions of the trade, erecting, we shall naturally have in connection with our manufacturing, but we also are taking second-hand machinery suitable, when rebuilt, for our equipment.

This we are entirely refinishing and erecting. This work is especially valuable in that it teaches boys ways of doing work without having every facility for doing it. There is no part of our work that is more interesting to the boy than this.

While it is, of course, impossible to predict the future of this or any other school on the basis of so short an experience, everything points to success. The only trouble that we can see ahead lies in the question of holding the boys to complete their course. We have set this at four years. Experience may show that three years are enough for the brighter boys, but we feel sure that for the average boy four years are none too many.

When the boys find that they can get positions at half a journeyman's pay long before graduating, there will doubtless be a tendency to accept them, which will be difficult to offset without some inducement in the way of compensation. That bridge, however, we shall not cross until we reach it.

CHAPTER XIV

PART-TIME COÖPERATIVE SCHOOLS

Cincinnati is unique among American cities, since it has a city university supported by taxation. Dean Herman Schneider, of the department of engineering of the University of Cincinnati, here organized in 1906 his well-known plan of coöperative education. This is a plan whereby the university gives certain of its students in engineering their book or study work, while the coöperative manufacturer, or group of manufacturers, provides facilities for the students to gain practical training in the shop. They work in school and in the shop during alternating weekly periods, and receive wages from their employers while in the shop.

The plan has been thoroughly and successfully tested in Cincinnati, both in the university and in the high schools, and has been adapted to radically different conditions in other cities, notably in Fitchburg and Beverly, Massachusetts. As school conditions in both these localities are essentially typical of those of the average city, these adaptations will be described rather than the initial experiment from which they received their original inspiration.

The coöperative industrial work of both school systems was fully explained at the 1910 convention of the National Society for the Promotion of Industrial Education, and *Bulletin No. 13*, Part III, contains the full addresses, of which the following are abridgments, the descriptive portions only being here given.

The Fitchburg Plan

By W. B. Hunter

Director Industrial Department, Fitchburg High School, Fitchburg, Massachusetts

Mr. Daniel Simonds, president of the Simonds Manufacturing Company, and several other Fitchburg manufacturers, were present at a meeting in New York when Professor Schneider explained his system, and the simplicity and practicability of the plan appealed to them immediately.

Here was a method that could be adapted to high-school students who wished to learn a trade and continue their education at the same time.

A plan was drawn up by the manufacturers for a combination shop and school course, and was presented to the school authorities, offering the use of their shops for the practical instruction of apprentices, if the school would provide the necessary collateral instruction. This the school board agreed to do, and the following manufacturers entered into the plan: the Simonds Manufacturing Company, manufacturers of saws and knives; the Fitchburg Steam Engine Company, manufacturers of steam engines; the Bath Grinder Company, manufacturers of grinding machinery; the Blake Steam Pump and Condenser Company, manufacturers of pumping machinery; the Cowdrey Machine Company, manufacturers of special and woodworking machinery; the Putnam Machine Company, manufacturers of lathes, planers, railroad tools, and general machinery; the Fitchburg Machine Company, manufacturers of the "L O Swing" lathe; the Brown Steam Engine Company, manufacturers of steam engines; the Jennison Company, tinsmiths and piping engineers; and the L. H. Goodnow Company, iron founders. Here are shops, far superior to any trade school that can be conceived of, given to the city for the training of mechanics,

and the city is not called upon to spend a single dollar for their equipment.

The course outlined is of four years' duration, the same as the regular high-school course. The first year is spent wholly in school, and the next three years alternate weekly between shop and school.

The manufacturers take the boys in pairs, so that by alternating they have one of the pair always at work, and likewise the school is provided with one of the pair.

Each Saturday morning the boy who has been at school that week goes to the shop in order to get hold of the job his mate is working on, and be ready to take it up Monday morning when the shop boy goes into school for a week.

Shop work consists of instruction in all the operations necessary to the particular trade.

Boys receive pay for the weeks they are at work at the following rates: for the first year, 10 cents an hour; the second year, 11 cents an hour; and the third year, 12½ cents an hour; making \$5.50 a week, or \$165 for the first year; \$6.05 a week, or \$181.50 for the second year; and \$6.87 a week, or \$206.25 for the third year; a total of \$552.75 for the three years. These rates are higher than the former apprentices have been receiving, the manufacturers having of their own accord raised the prices.

The 20 seniors earn	\$4,125
The 20 juniors earn	3,630
The 30 sophomores earn	4,950
Total	\$12,705

Here then is a strong inducement for the boy to continue in school; he can earn some money — in fact, he gets more than he could by going out and taking the ordinary jobs in stores or offices. When there is a vacation week in school, work is provided in the shops. These periods add to the amount of money just indicated as the yearly wage.

Every candidate is given a trial period of two months, beginning immediately at the close of school in June, and if he likes the work and shows aptitude for the trade, he takes the course; otherwise he drops out, and, if he chooses, takes up some other course in the high school. Thus we give the boy an opportunity to find himself. The course takes a boy at this critical period and shows him how work and education are correlated rather than things apart.

Our classes have no difficulty in keeping up their social standing. They constitute the major portion of the football, basket-ball, and baseball teams. They hold offices in their class organizations and are popular among their classmates.

The question might be raised as to the physical strain of working a week in the shop with regular hours, for these boys have no special privileges in the shops; they are subject to all of the shop rules, the same as the regular workmen. Not a single complaint has been made by the boys that the work is too hard. They come to school bright and active, and the fact that they have the strength and ambition to enter the various track events discounts any fear in that direction.

What we believe to be a strong feature of this course is the agreement entered into by the boy and his employer. After he has had a trial period of two months, and is satisfied that he wants to learn a trade, his parents agree that he shall continue the arrangement for three years; and the manufacturer, on his part, agrees to teach him the various branches of the trade designated in this agreement. The arrangement is mutual; each is bound to give the other a square deal. It is a business contract and means something.

What should be taught in such a course as this? Since the school term is only twenty weeks a year, it is evident that only such subjects as are of practical value to the student in the pursuit of his livelihood, looking, of course, to advancement in that

pursuit, should be included. In fact, that was the point insisted upon by the manufacturers — that this course be such as would make them better mechanics, and capable of advancing to the highest possibilities in the trade. Better a little done well than a smattering of a large variety of subjects. The regular courses of high-school study were discarded, precedent was ignored, and such subjects were selected as would fit the students to be intelligent mechanics. This is the course.

FIRST YEAR. *All School Work*	
English and current events	5
Arithmetic, tables, and simple shop problems	5
Algebra	5
Free-hand and mechanical drawing and bench work	8
SECOND YEAR. *School and Shop Work*	
English	5
Shop mathematics, algebra, and geometry	5
Physics	4
Civics	2
Mechanism of machines	5
Free-hand and mechanical drawing	6
THIRD YEAR. *School and Shop Work*	
English	5
Shop mathematics	5
Chemistry	4
Physics	4
Mechanism of machines	5
First aid to injured	1
Free-hand and mechanical drawing	6
FOURTH YEAR. *School and Shop Work*	
English	5
Commercial geography and business methods	2
Shop mathematics	4
Mechanism of machines	4
Physics, electricity, and heat	4
Chemistry	6
Free-hand and mechanical drawing	5

English is taught throughout the four years. In order that he may speak and write intelligently, the pupil is given forms of business papers, shop terms, and spelling.

Current events and industrial history, the daily happenings in the industrial world, the history of the iron industry, factory systems, new inventions, and mechanical journals are discussed in order to keep in touch with mechanical affairs.

Mathematics begin with simple propositions in mensuration, fractions, metric system, and circular measure. General shop mathematics deal with problems on cutting speeds and feeds, belting, gearing, strength of materials, and general cost figuring.

Algebra is taken up to give facility in using the formulæ so common in the trade journals and handbooks, and leads up to simple geometric and trigonometric formulæ.

In what we term mechanism we treat of the construction and uses of the various machine tools that every shop contains. The names and uses of every part are learned in the school as well as in the shop. The reasons for certain shapes of the various parts, kinds of material used in their construction, shapes and kind of tools used, and their cutting action are clearly pointed out in the analysis of the shop work.

Physics is the study of the laws underlying all mechanics, and here again the study of working examples is emphasized rather than the theories of abstruse phenomena.

Chemistry takes up the nature and qualities of metals and salts, tests that can ordinarily be applied to fractured metals, hardening and tempering processes.

Commercial geography comprehends the study of the source of supply of the various industries, preparation and methods of transportation, cost of materials, railway systems, waterways, etc.

First aid to the injured is made a subject of instruction. There is no place where accidents are more liable to happen than in the shop, and some knowledge of how to care for the injured is

a valuable asset to the workman. The textbook of the National First Aid Association is used for this study.

Drawing is the sign language of the mechanic. Almost invariably, in explaining an object or piece of work, he takes his pencil and makes or attempts to make a drawing. Hence we devote a large share of our drawing period to free-hand work. We begin with simple objects and then take up machine parts. Thus the boy sees the object and at the same time becomes familiar with the proportions and shapes of ordinary machine parts. Later he draws them mechanically with instruments to scale.

Civics and American history are essential to good citizenship, and a careful study of the city and state government is necessary for intelligent and progressive work. This end is what we have in mind when teaching this subject.

Business methods introduce the study of the organization of shop systems, including the receiving of materials, laying out of work, tagging, inspecting, and routing of work through the shop, and also the consideration of general office systems.

The workman will see the dependence of one department on the other, the necessity for the coöperation of all to secure good results. He will appreciate the cost of doing business, and he will see that it is not all profit; that it costs something to erect and equip a manufacturing plant, conduct an office, and maintain a corps of salesmen and advertising agents. In short, he will be given an idea of the great responsibilities of the employer. This will help solve the labor and capital problem.

The method pursued to put the scheme into operation was this: On August 1, 1908, I began interviewing applicants and their parents. Previously the high school and the public had been informed that the course would start in the fall. Boys were selected who wished to follow the trades, and eighteen were chosen to start the course. By daily visits to the shops during

this period the necessary arrangements were made, and by the opening of school in September these boys were all at work. On the seventh of the month the boys were paired off, and half of them were assigned to work in the shops during the alternate weeks of the school year while the rest came to school, the "pairs" changing places with each other every week. Some boys dropped out while others came into the course, so that our initial class has twenty pupils in it.

It should be remembered that this half-school and half-shop year was the second year in the regular high-school course. Now all four classes are in operation, with 20 seniors, 20 juniors, 30 sophomores, and 30 freshmen, making 70 boys at work in the shops, and 100 in the course.

By weekly visits to the shops, and by inquiries of the boys during their week at school, I keep in close touch with their work.

A written report of the work in the shop is also passed in on Monday morning of the school week, and is inspected and filed for reference.

Every opportunity for questions regarding shop work is encouraged in the school, and these questions are most intelligent. Many problems are discussed that the shop has not the time to consider, and the interchange of methods used in the different shops broadens and helps all the boys.

We are now in our third year, and the first class will graduate in June, 1911, as journeymen. The coöperative course, by the verdict of the students, the coöperating manufacturers, the school authorities, and the community, has proved an unqualified success, and there is no question in my mind but that the plan is the correct one to produce just the kind of workmen that the country demands, and give to the workman the ladder to climb to the highest level that his native talents and ability will allow.

The Beverly Industrial School

By Adelbert L. Safford

Superintendent of Schools, Chelsea, Massachusetts

I am to say a few words about the Beverly Industrial School. I ought perhaps to preface my remarks with the statement that I am not now in charge of this school, having severed my connection with the Beverly schools last August.

To view an institution or a movement in proper perspective, it is often necessary to know its origin and the circumstances attendant upon its advent. The *initial* impulse that led to the establishment of this school arose from a purpose to promote the social betterment of the large number of young people who leave school in the later grammar-school or earlier high-school grades, having little or no specific preparation for earning a livelihood, and little immediate wealth-producing ability in any direction. Their unpreparedness and consequent struggle against fearful odds are painfully apparent to even the most casual observer.

The actual realization of this purpose became possible through the coöperation of Mr. M. B. Kaven and his associates in the management of the United Shoe Machinery Company. These men, I think, were actuated by a purpose to promote on a broad and equitable basis any plan that tended to provide a proper supply of competent journeymen mechanics, who should possess the necessary all-round skill and experience for tool and jig making and for constructing experimental machines. It was no part of their present purpose to make foremen, engineers, or inventors. It was no part of their purpose to provide an excess of workmen to take the place of present employees at a reduced wage. The purpose, as in the lower industrial schools of Germany, was to fill up the "rank and file," not to provide "officers of the line." I received through the mail, the other day, a pamphlet containing a rather elaborate, though it seemed to me a

somewhat opinionated argument, tending to show that the laboratory of an institute of technology is superior to a part-time industrial school as an efficient means of training skilled mechanics. It would have been equally to the point to have argued that the moon offered superior advantages as a place for teaching the art of aviation. How shall the aviator reach the moon? How shall boys, dropping out of the grammar-school or lower high-school grades, past fourteen years old, generally dull at books, in nearly all cases without funds, reach the laboratories of an institute of technology?

The pupil entering the Beverly Industrial School must have reached the age of fourteen and have completed the sixth year or grade of the elementary schools. He must also obtain from the school physician a certificate to the effect that he is physically able to perform the work to be undertaken. Many of the pupils have completed the elementary school (eight years), and some have taken one or two years in the high school. The ages vary from fourteen to eighteen, but sixteen is considered the most favorable age for undertaking this work, and the end of the tenth year in school (second year of the high school) the most favorable place for it in the public-school curriculum.

Very great care has been taken in the matter of vocational direction of candidates for this school. Many have been advised not to enter it. Many have been refused admission. Only those have been received who, after a full understanding and consultation with parents, have expressed the desire to enter with the determination to stay until they have learned the machinist's trade, and who appeared physically and mentally fit to undertake this task.

The Beverly Industrial School was not established in response to a strong popular demand, and consequently is not yet strongly intrenched in the popular favor. It has been received sympathetically on the whole, though not altogether without suspicion on

the part of a few that it was intended to benefit the manufacturer rather than the boy.

Such was not the case, and, contrary to a popular impression, the idea of the school and the main features of its organization did not originate with the United Shoe Machinery Company, and the United Shoe Machinery Company does not manage the school. The school is of course conducted in a manner to receive their approval as a whole, though not necessarily in detail.

The school was indebted to the Fitchburg plan and the University of Cincinnati for the half-time idea, which was adopted from the start. The pupils are in two divisions of about forty each, which continue alternately one week at the factory and one week at the high school; but at the factory they are in a separate department and do not come into contact with regular foremen or workmen, and at the high school are in separate classes with separate instructors, different hours, and wholly different entrance requirements and course of study. This school is radically different from the Fitchburg plan in the fact that, through a unique scheme of coöperation, the trustees of the school retain full control of the pupils while in the factory, and the same person instructs a particular division in both factory and school. By this means the work is conducted in a way to contribute most effectually to the boy's progress in his trade, and not to suit the exigencies of the factory; and the instruction is imparted by a trained teacher and not left to the uncertain pedagogical ability of the ordinary foreman. Most important of all, it safeguards the pupils from exploitation and the manufacturers from unjust suspicion. The course of study is correlated with the shop work as the major center of correlation, and with the pupil's duties to himself and society as the minor center of correlation. Many of the principal features of the course of study were adopted from the course of study of the continuation school

for machinists' apprentices in Munich. However, the aim has been to try to understand the needs of these particular boys in relation to the work they are to do, and to provide for these needs in the most direct way possible. The length of the course of study has not been determined, but is expected to be three or four years; it will probably vary greatly with the ability of the pupil. Much of the instruction tends to become individual, and it has been found feasible to admit new pupils at any time in the year.

The Board of Trustees was created by the following order of the city council of Beverly.

On May 18, 1909, Alderman James A. Torrey introduced the following order in the Board of Aldermen:

CITY OF BEVERLY

BOARD OF ALDERMEN, MAY 18, 1909

Ordered, That an Independent Industrial School be and is hereby established in Beverly in accordance with Chapter 505 of the Acts of 1906, as supplemented by Chapter 572 of the Acts of 1908, for the purpose of instructing youths between the ages of fourteen and twenty-one years in day or evening classes in the machinist's trade or in such other industrial trades or occupations as shall be deemed expedient by the Board of Trustees of said Industrial School, and also for the purpose of instructing any persons already employed in the industries in evening classes in such industrial trades or occupations as shall be deemed expedient by the Board of Trustees of said Industrial School.

The management and control of the Beverly Independent Industrial School and of all property pertaining to the same shall be vested in a Board of Trustees, consisting of his Honor, the Mayor of Beverly, five members of the Beverly School Committee, to be designated each year by the chairman of the school committee, one or more citizens of Beverly, appointed for a term of three years by his Honor, the Mayor, as follows: Each proprietor of an industry who shall provide facilities satisfactory to the Board of Trustees for the practice work of pupils of the school shall be represented by one member of the Board of Trustees nominated by the proprietor of the industry and appointed by the Mayor.

The Board of Trustees of the Beverly Independent Industrial School shall be authorized to accept the coöperation of the school committee, and

to occupy and use school property with the permission of the school committee, and to enter into such arrangements of coöperation with proprietors of the various industries as the Board of Trustees shall deem expedient.

The Board of Trustees shall be authorized to elect a secretary and executive officer and all other necessary officers and teachers, and to fix their salaries.

The Board of Trustees shall conduct all the affairs of the Beverly Independent Industrial School in such a manner as to receive the approval of the Massachusetts Commission on Industrial Education, and to entitle the City of Beverly to be reimbursed by the Commonwealth for such portion of the cost of maintenance of the Industrial School as is provided by the laws of the Commonwealth.

This order passed both branches without amendment, and was signed June 26, 1909.

The trustees consist of the mayor, the chairman of the school committee, four other members of the school committee, and the assistant superintendent of the works of the United Shoe Machinery Company at Beverly. The superintendent of schools acts as secretary and executive officer. The assistant superintendent of the factory as chairman of the committee on instruction and the superintendent of schools as executive officer of the trustees have directed the operations of the school, subject to the approval of the Board of Trustees. While the management of this school is independent of both the factory and the high school, it has access to both, and shares in the facilities that they both offer in equipment, organization, and established standards of discipline, workmanship, and general efficiency. It is of the greatest value and importance in an undertaking of this character to be closely associated with a school and with a factory with established standards. The high-school system stands for the best educational practice, the factory system stands for the best methods of manufacturing. The Industrial School to properly fulfill its functions must measure up to both standards. Pedagogically it must be a good school, and industrially it must make efficient workmen.

The fact should not be overlooked that such a school as the Beverly Industrial School can be established at almost a nominal expense for buildings and equipment, the providing for which sometimes proves to be so serious an obstacle that a beginning is delayed indefinitely. Also in this school not only the industrial experience and acumen of the manufacturer is utilized, but his continued interest and coöperation are assured. These, I believe, broadly speaking, are fundamental. If industrial education is to succeed generally, we shall require help from the manufacturer. He cannot remain passive. He must bear his part of the burden, both administrative and financial. Another characteristic of this school is that it is distinctly a public school, both at the high school and at the factory. In some other schools that I have investigated, pupils that receive instruction in a factory are indentured to the manufacturer, and there is not wanting the suspicion that in some cases the boys were exploited for the profit of the manufacturer. In this school there is no indenture. A pupil is free to leave at any time, if he thinks it advantageous. But most important and essential of all the general principles of the conduct of this school is the utilization of the product to pay the cost of the raw materials, and to afford the pupil remuneration for his labor in proportion to his competency as a workman. Industrial schools are bound to be expensive, and unless the product pays at least the cost of raw materials the necessary expense of such schools will be prohibitive for many municipalities for a long time to come. It is almost equally important that the pupil should have the stimulus of some remuneration for his labor.

The general arrangement between the trustees and the United Shoe Machinery Company is as follows:

The company has organized in the factory a separate department devoted exclusively to the school, and has equipped it fully with the necessary machine tools for a general machine shop, to accommodate about forty workmen at one time.

These machines include various types of drills, millers, grinders, lathes; planers, and screw machines. The operating accounts of this department, known in the factory as the "school job," are kept by the factory accounting department entirely distinct, as if the "school job" were a separate factory. The company furnishes the equipment, raw materials, and drawings for the work to be performed, and charges against the school the proper amounts for "overhead charges," i.e. power, light, heat, and rental of floor space and machinery, and for the cost of raw materials. The company also pays the school instructor when he is acting as foreman of the "school job," and debits the school account for that amount. All product that passes the inspection of the regular factory inspectors is taken by the company at established prices, determined by the cost of production of a like article in the factory. The "school job" is credited with the value of these products. One half of the piece price for these products is paid to the pupils by the company and charged to the school account. The balance of the value of the product is what pays the difference in cost between maintaining the "school job" and any similar job in the factory. If in any case the "school job" shows a profit, it is agreed by the company that such profit shall belong to the school, to be distributed in increased wages or in any other way that the trustees may determine. Thus far there has been in the maintenance account a moderate deficit, which the company has carried. The proportion of deficit has constantly decreased as the pupils have become more proficient, and it seems quite possible that the "school job" will ultimately be self-supporting.

Whatever may be said about the piece price as a basis for wages of regular workmen, it seems to the management of this school that it is unquestionably the best system for their pupils, because the pay envelope is to the boy a constant measure of his productive efficiency both in utilization of time and in standards

of workmanship. If he wastes time, he does not turn out so many pieces; if he is inaccurate in workmanship, the pieces do not pass inspection. Thus the importance of a proper balance between time and good workmanship is constantly impressed upon him. The hours and discipline at the factory are in general the same as required of regular workmen.

At present the pupils work fifty hours a week, having a nine-hour day, with Saturday afternoon off. The instruction at the factory is of course individual, and comprises the operation of the different machine tools on various materials and classes of work and specializing on machine tools for which special aptitude is shown. At first the pupils at the factory manufacture simple machine parts, using jigs and other labor-saving devices, as in other parts of the factory. Gradually they learn to set up their own work, and as fast as they gain confidence and become proficient on one machine, they are changed to another. The machines are not taken in a particular order, and necessarily the different pupils are using different kinds of machines at any given time. As the pupils become more skillful they will manufacture tools and jigs, and it is expected that eventually some complete machines will be built and assembled in the school shop, although in the factory system all machine parts are sent to the general stock room and assembled from that source.

Each pupil keeps a notebook in which he writes a description of each article manufactured by himself, draws a free-hand mechanical sketch of it with dimensions, and describes the operations in its manufacture and the tools used. When the week at the factory is over, the machinist instructor accompanies his class to the high school and, for the following week, gives instruction five hours daily in various kinds of drawing, shop mathematics, machine-shop practice, and notebook records of the work done at the factory. Other instructors from the high-school staff give instruction for three hours daily in science, business and social

practice, and in personal, social, and civic duties. Each division is divided into two groups, somewhat according to proficiency, and one class usually studies while the other recites, after the manner of the elementary schools.

There are many advantages in this plan of having the machinist instructor accompany his class at both school and factory. The theoretical work can be made more available for immediate application, and the shop work can be done with a more intelligent regard for the principles, mathematical or otherwise, that underlie it. The dual experience is good for the instructor. The work at the factory keeps him from impractical theoretical instruction in the school, and the teaching in the school gives him the pedagogical insight necessary to avoid being a superficial and ineffective instructor in the shop. The school day for these pupils approximates the factory day, and is about eight hours, with the Saturday holiday and no home lessons. All studying is to be done at the school.

The machinist instructor has charge of the class from 8 A.M. to 12 M. and from 1 to 2 P.M. Part-time specialists have charge of the class from 2 to 5 P.M. In general the machinist instructor teaches the subjects belonging to the major center of correlation, the shop work; while the special part-time instructors deal with the subjects belonging to the minor center of correlation, the pupil's obligations to himself and to society. The course of study for this industrial school is still in the making, but certain general lines of study have been laid down that seem permanent, and certain principles applied that appear to be fundamental. Two chief considerations must determine the choice of subjects to be taught in an industrial school — the demands of the trade, and the personal, social, and civic responsibility of the man.

At the beginning and until the pupil has had considerable shop experience there should be no formal development of the topics in logical order, as in the ordinary textbook. The

substance of the instruction should be the real problem, not its shadow or imitation from a textbook. In other words, science, mathematics, and drawing should be begun as they are applied in that industry. Formal and systematic treatment by development in logical order should be reserved to the most advanced years of the course, if introduced at all. There is danger of erring in this matter, especially on the part of high schools offering vocational courses, or any school in which the teachers have not practiced the trade for which they are preparing the pupils. If time permitted, I should be glad to speak of the treatment of some of the subjects in detail. I will merely allude to a few points that seem distinctive. Drawing is divided into (1) mechanical sketching; (2) working drawings to scale; (3) perspective; (4) free-hand industrial drawing; color and design; (5) machine design. Considerable stress has been laid on the mechanical sketch as fundamental. These sketches may be made free-hand or with the use of the ruler and simple instruments, but are not to be drawn to scale. Coördinate paper may be used in order to approximate scale if desired, but it is not necessary. All dimensions required for making a complete working drawing to scale, with as many different views as necessary, are to be indicated in figures on the mechanical sketch, so that no reference to the object will be necessary while making the working drawing.

The ability to make such a sketch is of greater value in itself to the workman than the making of working drawings. Also the ability to make a quick sketch of the essential features of a complete machine, to show "what it looks like" and "how it works," is of great value to any one.

The working drawing begins from the start with drawings of simple machine parts, in accordance with the system in vogue in the drafting department of the factory.

I would like to speak of mathematics and instruments of precision, of current and historical machinists' literature, and

of lectures on modern machine-shop practice, but time forbids. Science is treated on the same principle as the mathematics; first the applied and then the theoretical, or rather the theoretical through the concrete. The general topics are mechanics; electricity as applied to machinery either as a power or in a process; chemistry of steels and other materials, and of their manipulations as in tempering; also lubricants and cooling mixtures.

The remaining topics are not particularly related to the trade, but they are dealt with in the most direct and practical way that we are able to devise. They are grouped under the general heads of business and social forms and practices, and personal, social, and civic duties.

In conclusion, let me recapitulate and emphasize a few features of the school that seem to us good and important, and speak of a few difficulties which we have encountered.

(1) This school has the best educational talent and facilities of the city associated with the best industrial talent and facilities, in harmonious coöperation. There has been no friction. The plan works. The school work is standardized by contact with an established school, and the shop practice by contact with an established factory.

(2) The boys in the factory are together under the direction of the regular machinist instructor, who is employed by the school. The Board of Trustees is responsible for the proper management of the practice shop. Of necessity the methods of work conform to the practices of the factory, as they ought, but in case of any dispute the authority of the trustees is absolute, except that the company, of course, has the right to withdraw altogether from the arrangement.

(3) In general, the workmen have looked with favor on this school. From a third to a half of the pupils are sons or close relatives of workmen in the factory. Organized labor has been

inclined to favor the Beverly plan, because of full control by public authority.

(4) The absence of indenture is in keeping with a democratic spirit and a truly public school. The piece price, besides its other advantages, makes indenture unnecessary.

(5) Half-time for classroom work is not unique, but it is about the right amount and should be emphasized because some schools give less.

(6) A salable product is necessary partly to remunerate the boy, partly to reduce the cost of the school, but chiefly to put to the test day by day the boy's actual productive ability.

(7) The plan of having the machinist instructor accompany the class in both school and factory is desirable for many reasons.

(8) The general scope of the course of study seems to be sufficient. The whole career of the school has been singularly free from friction or controversy.

But we have our troubles. The school has not yet passed the experimental stage. It has not yet fully achieved the standards that it has set for itself, and of course there are a multitude of details of curriculum and practice to be worked out and standardized. The first great danger to this school is a certain amount of inertia and indifference on the part of the general public. If the school should "strike a snag," nobody knows what attitude the public would take. Serious consequences might result from the lack of the right kind of strong public support. A second difficulty is the large expense of such a school. With the shop practice self-supporting, it cost $80 a pupil last year. The machinist instructors receive from $30 to $35 per week, and the part-time specialists, $1 or $1.50 an hour for fifteen hours per week; and there are fifty weeks in the school year. The greatest difficulty of all has been to secure suitable teachers. The two machinist instructors were chosen from the thirty-five hundred employees of this company, and there were less than

half a dozen that we felt we could consider at all. The part-time specialists are mainly high-school teachers already fully employed, who were drafted into service to meet the need. It ought also to be confessed that we have not yet achieved in the industrial school the strong moral atmosphere and the social and æsthetic ideals that are the goal of the public school. The moral fiber of the boys is the same, but there is a certain abandon that smacks of the factory rather than the school.

But despite these and other troubles, we believe the Beverly experiment is a long step in the right direction.

A comparison of the two plans described above is interesting. It should be noted that the former places great value on the binding agreement between employer and pupil, while the latter states that it is better for the pupil to be left free or to be subject only to the control of the trustees.

It should be recalled that organized labor has officially placed itself on record[1] as strongly opposed to the coöperative plan of industrial education. It is believed that labor will find little to criticize in the Beverly plan, with its absence of the indenture, its "piece work," and its domination by the educational authorities.

The author is inclined to think that Mr. Safford's exposition of the advantages and disadvantages of the coöperative plan is the most careful, discriminating, and impartial statement of this subject which has yet appeared. The description of the school is accurate.

The part-time plan of education is one which is susceptible of adaptation to such widely diverse conditions that there can be little doubt of its ultimate adoption by many schools. It

[1] See "Industrial Education," p. 11, published by the American Federation of Labor, Washington, D.C. It should be said that labor is not a unit on this question, and that prominent representatives of labor have publicly indorsed the work in Cincinnati and even in Fitchburg.

lends itself, perhaps better than any other plan, to the limitations of the small town or village. One might almost say that wherever two boys could be "paired," and one employer could be found who would work them alternately, any school, except the most conservative and inflexible, could inaugurate a system of part-time coöperative education. The plan has been put into practice not only in connection with large machine-making industrial concerns, but also in the textile industry, in office work, and even in agriculture.

CHAPTER XV

THE CONTINUATION SCHOOL

It should be recalled that our problem is an extremely large and complicated one, and that, with all possible agencies at work, we shall still have boys and girls forced into the industrial market with inadequate preparation and small appreciation of the nature of life's economic problem.

The continuation school is planned to administer to the needs of such boys and girls. The state proposes to retain an interest in them for a longer period, and to assume more responsibility for their success and happiness.

Such a plan contemplates the coöperation of the school, the employer, and the community, and its success depends upon a keen civic consciousness, and especially upon some strong personality to awaken that consciousness and to direct subsequent action. It is to be doubted whether the continuation schools of Munich would have attained such conspicuous success without the guiding interest and the optimistic personality of Dr. Kerschensteiner. As it is, they stand as the best examples of this type of school.

Wherever the industries of a community are sufficiently homogeneous, or where any industry or group of industries can decide on a body of knowledge which it would be desirable for their operatives to acquire, and especially wherever the superintendent of schools is able and willing to secure the necessary conditions of coöperation, the continuation school should have wide usefulness.

Cincinnati, Ohio

The most striking example of continuation schools in this country is that afforded by the city of Cincinnati. In an address before the National Society for the Promotion of Industrial Education, Boston, November 18, 1910, Mr. Frank B. Dyer, superintendent of schools, described the opportunities in that city for obtaining an industrial education. After speaking of the establishment of the part-time coöperative plan for which Cincinnati is so well known, and the new vocational high schools which have still further utilized that plan, he explained the purpose and described the operation of the continuation schools as follows:

"Of course the school shops run at night and are open to adult workers and also to apprentices. There are twenty-four hundred enrolled at present in the industrial night classes. It was soon found, however, that night work does not attract the apprentice. Concentrated attention to a machine for ten hours leaves little surplus energy to draw on at night. A city offers many attractions more alluring to a young mechanic than a night school. After repeated and urgent advertising in shops we were able to get less than eight hundred apprentices in the iron industry who would settle down to regular night instruction. For example, we got twenty-six pattern-maker's apprentices, and those dwindled to sixteen. They were not to blame. They had not the physical endurance.

"Thus we came to see that the apprentice is distinctly a daytime proposition. His education must be given not in addition to his work but in the place of a part of his work. Some of the progressive manufacturers of our city, realizing this, introduced apprentices' schools in their factories, but they found themselves unable, single-handed, to cope successfully with the situation for many reasons. An agreement was finally made

with the Board of Education to establish a day school for machine-shop apprentices. The plan was submitted to the Central Labor Council, to a committee of manufacturers, and to the Board of Education, and received the approval of all.

"The continuation school for machine-shop apprentices was opened September 1, 1909. It runs forty-eight weeks a year, eight hours a day, for four and one-half days a week, besides two half days which are spent by the teachers in visiting the boys in the shops, seeing the conditions under which they work, consulting with the foreman about their needs, and getting ideas and materials for guidance in teaching. This is an essential part of their work, for there is no handed-down course of study as yet. It must be worked out as they go along.

"The students keep a complete file of their work, so that the details of the course lie behind them instead of ahead of them. The course runs through four years, and consists of one hour of blue-print reading and free-hand and mechanical drawing, one hour of practical mathematics, one hour of shop science and theory, and one hour for reading, English, spelling, commercial geography, and civics; the last hour takes the form of stereopticon talks, readings from industrial history, biography, and geography, and discussion of civic and labor questions.

"There are about two hundred students, divided into nine groups, according to proficiency. They come one half day, four hours a week, and are paid their usual wage for attendance by their employer, and are docked for absence. The least mature boys come on Monday, the most mature on Friday, and graded groups between.

"The grading of the students must be somewhat elastic, owing to the difficulty of arranging a program for the individual boy that will best suit the convenience of the manufacturer, and also owing to the great differences in the mental attainments of the boys—some having been in high school and some not able

to repeat the multiplication table or spell the names of the days of the week. This necessitates having two teachers to a group of twenty or twenty-five, one to conduct the general work and the other to give much individual instruction.

"The entire cost of the school is about three thousand dollars a year, or about fifteen dollars a pupil, on the basis of the average number in attendance.

"Strange as it may seem, the chief difficulty encountered in the operation of public schools for apprentices is not in securing the interest of the employers, the approval of labor organizations, the willingness of boys to come, or the necessary funds from the Board of Education; the chief difficulty is in securing properly qualified teachers — teachers who will command the confidence of foremen and employers by their knowledge of shop conditions, who will secure the interest of boys by their enthusiasm and skill in instruction, and who at the same time meet the demands of school authorities as to scholarship and character. We must steer clear of the charlatan on the one hand, and, on the other hand, of the school pedant, who has knowledge in water-tight compartments. After corresponding with technical schools all over the country and finding no suitable person, I decided to study the shop men of our own city, and found a man who had worked nine years in the shops and had left to prepare to be a teacher. His old love for the shop came back to him, and he had been for several years teaching apprentices. He had worked over his whole scholastic outfit in terms of shop practice. He had studied the machines to see the problems they presented in mathematics, science, and drawing. Elimination of waste and economy of output was the guiding principle of his investigation and instruction. He trains his own teachers, and now has three under way, who are assisting by night or day.

"The school operates at night for the improvement of adult

machinists. On Friday night the class is composed of foremen, thirty-two at present, and their discussions illuminate all phases of shop work.

"The work of the school is closely applied to the work of the shop. It is designed for the intellectual improvement of the boys and to give them intelligent interest in what they do in the shop, but there is no machine work in the school. For example, suppose the drill press is under consideration. The boys first read the catalogue description (catalogues are supplied in sets of twenty-five by the manufacturers). The technical names of parts are noted. Different machines are compared and their respective merits examined. The scientific principles involved in their operation are described. This leads naturally to a study of the blue prints, which are supplied by the manufacturers. This is followed by free-hand drawings of some parts of the machine. In the discussion the mathematical relations receive especial consideration. For instance, the speed of the spindle as determined by the relation of the diameters of the cone pulleys is a problem in complex fractions, and the boys for the first time in their lives discover the use of what in their early school days was a senseless puzzle. An hour's lesson on complex fractions follows, using an arithmetic first and then a prepared sheet of exercises applied to the drill press. These lessons are prepared beforehand with great care by the teachers. A blue print of each lesson, with the details to be worked out clearly indicated, is placed in the hands of each pupil, so that there is no waste of time. These when filled complete what the boys call "dope sheets," and are filed by each boy in a large envelope. The exercises are arranged in sequence, so as to conduct the boys through arithmetic, algebra, geometry, and trigonometry, using only those parts that have practical application in the shop, with such essential principles as are necessary for an understanding of the shop problem.

"The above description will apply fairly closely to two or three of the four hours' work a day. The last hour, as indicated before, is recreational, inspirational, informational, and cultural. A piano is provided, a stereopticon with hundreds of slides, maps, and charts, also sets of books on civics and industrial biography, and so forth.

"The employers and foremen say there is no loss in output by the boys' being out one half day a week. They more than make up for the absence by their diligence and zeal when they are at work. When they start to school they are as a rule depressed, indifferent, disgruntled. They look upon their employer as an aristocrat, their foreman as a slave driver, their machine as a treadmill, and the world at large as against them. Their faces are frozen in a perpetual grouch. The path to advancement seems long and uncertain. As they feel mind and body settling in a groove they become rebellious and ready to quit. The school comes as a new interest in their lives. They can scarcely realize at first that anybody cares, but soon they thaw out and a new light shines in their eyes. They see for the first time the purpose of instruction which bored them in school days. They have a motive. They can put their knowledge to use. They become interested and intellectually awakened. Their attitude changes toward their employer, their foreman, their machine, the world. They are no longer mere hands, cubs, operatives; they are becoming masters of an honorable craft. As they are induced to go from one shop to another they have been known to make it a condition that they be permitted to attend the continuation school.

"The Board of Education, and others in our city who have seen the effect of this school on the boys, persuaded the Ohio legislature last spring to pass a law authorizing boards of education to establish continuation schools, and requiring the attendance in daytime, not to exceed eight hours a week, of all who go to

work under sixteen years of age. The Cincinnati Board has set aside fifteen thousand dollars to put this law into operation in the year 1911. It is therefore evident that our experience gives us faith in the idea. We purpose in Cincinnati to open two classes of continuation schools: one compulsory, for those who are under sixteen; the other voluntary, for those who are apprenticed. The plans are now ready to open such a school in salesmanship for girls in stores.[1]

"It seems strange that all oversight of children ceases when they go to work, strange that the state has not considered it a duty to look after their education at the critical period of their existence. Then, if ever, they need moral guidance and ideals kept steadily before them. That is the time they feel their deficiencies and need instruction and direction. Then they need to be taught to apply what they know to a practical situation. Then their attitude is determined, and they will become mere drudges, shirks, and outcasts, or will acquire that joy in work which will transform their task into an interesting vocation and themselves into interested and ambitious craftsmen. As I see it, we should not wait for trade schools to catch boys and lead them to a vocation. We must catch the boys and girls when they go to work, letting them get their skill under commercial conditions, but supplementing it, as they go along, with the guidance and instruction they need in this crisis of their lives."

Cleveland, Ohio

Acting under the new state law relating to continuation schools, Cleveland has established fourteen centers for carrying on such work.

Under this law the city is permitted to establish continuation schools, and to require the attendance of all children who go to work between fourteen and sixteen without having passed the

[1] All of these plans were brought to fruition during the fall and winter of 1911.

elementary grades. In Cleveland the minimum amount of continuation-school work is fixed at six hours a week. This may all be taken in one day, or the pupil may attend two three-hour sessions held on different days. In any event the work must all be done between 8 A.M. and 5 P.M.

Boston, Massachusetts

The following quotations from documents issued from time to time by the School Committee of Boston, show the history and the present status of the continuation-school movement in that city.

While the examples given are of commercial rather than of industrial education, the methods employed are of interest. As they differ in some important respects from the Cincinnati plan, they are noted in this connection.

The question of establishing continuation schools, modeled to some extent after the plan of schools of that name which have been successfully conducted in Europe, and especially in Germany, has been under consideration by the School Committee of Boston for more than a year. The object of such schools is to provide for young men and women an opportunity to improve their knowledge of the business in which they are engaged, and to increase their industrial efficiency. The schools require the coöperation of employers in permitting their employees to attend during working hours and without loss of pay, and much interest is being shown in them by the education committees of Boston's various trade organizations.

Early in May, 1909, the committee passed an order instructing the superintendent to invite the coöperation of merchants and manufacturers in the project.

A room about 30 × 40 feet, with a small office adjoining, was rented at No. 91 Bedford Street (a location convenient to both the retail and wholesale business districts) at a cost of $125 per month, and was fitted up with forty regular schoolroom desks, extra chairs, tables, portable blackboards, and maps, at a cost of about $260. The only expense assumed by the School Committee has been the salary of Mr. Field (director of evening and continuation schools), who has charge of the work, the rental of rooms, the cost of janitor service, and the necessary fittings. All other expenses have been borne by the business firms interested in the schools.

SHOE-AND-LEATHER SCHOOL

It was decided that the shoe-and-leather industry offered the most promising opportunity for the establishment of the initial course, and the directors of the New England Shoe and Leather Association promptly and cordially offered the coöperation of that organization.

The class began its sessions on April 5, 1910, meeting in the above-named rooms on Tuesday and Thursday afternoons from 3 to 5 o'clock, the term being for ten consecutive weeks.

DRY-GOODS SCHOOL

On April 11, 1910, a course for employees in the dry-goods business was opened in the above-named rooms. The sessions of this class are held on Monday and Friday afternoons from 3 to 5 o'clock, and are to continue for ten consecutive weeks.

Pupils in shoe-and-leather and dry-goods classes are young men from wholesale and retail houses, many of them being salesmen who are preparing for still higher positions, such as road salesman, buyer, etc.

The instruction is given by employers and experts in each industry, under the direction of Mr. Field and an advisory committee of prominent representatives of the industry in Boston.

PREPARATORY-SALESMANSHIP SCHOOL

Two classes in preparatory salesmanship were also established at No. 91 Bedford Street: one for boys, opening on April 12, and holding its sessions from 8.30 to 11 o'clock A.M. on Tuesdays and Thursdays; and the other for girls, opening on April 13, and meeting at the same hours on Wednesday and Friday mornings, the term of both classes being ten weeks.

Pupils in the preparatory-salesmanship classes are boys and girls working as stock clerks, bundle clerks, auditors, cashiers, and the like, in retail stores. They are preparing for promotion to the position of salesman. To these two classes pupils over eighteen years of age are not admitted.

An advisory committee of business men has also been established for these classes. The instruction is given principally by a teacher in one of the public schools, especially fitted for the work, and whose compensation is assumed by the various business houses whose employees attend the class. Her instruction is supplemented by frequent talks by heads of departments and other experts in the employ of various dry-goods houses.

The principal feature of the instruction in all these classes is the practical talks and lectures, each one hour in length, given by men who have built

up large business enterprises, and by skilled men in their employ. These lectures are stenographically reported, and have been published to some extent in trade papers, such as the *Boot and Shoe Recorder*, *Shoe and Leather Reporter*, and *American Shoemaking*. The instruction in salesmanship is of a more elementary character and is not reported.

The various lecturers bring large quantities of material to the classes for illustrating their talks. This material includes leathers, shoes, and fabrics, in all stages of their manufacture. They also make considerable use of the blackboard.

All pupils have become members of the class through their own initiative or at the suggestion of their employers. They show a very remarkable interest in these talks, and frequently spend their noon hour at the school studying the stenographic reports. Many have already visited manufactories to study processes, and members of the dry-goods course have spent many of their evenings at the Textile Exhibit in Mechanics Building.

The members of the classes are required to write theses, which are always on file for the inspection of their employers. Those who satisfactorily complete a course will be granted a certificate of proficiency.

It has not been considered wise, for the present at least, to establish any age limits for pupils attending these classes, except that no pupils over eighteen years of age are admitted to the classes in preparatory salesmanship. The ages of the pupils in the other classes range from fifteen or seventeen to twenty-eight or thirty. Some of the pupils are extremely well educated, and are college graduates, but the majority have not graduated from the high school. Each class is composed of from forty to fifty pupils. The attendance averages about 98 per cent, and no disciplinary requirements are necessary.

A recent circular shows that the above-mentioned classes and also a new class in banking are now held at 48 Boylston Street.

Another circular announces the organization of a class in household arts as follows:

The Boston School Committee has authorized the organization of courses in household arts for young women and girls.

These classes will open at 52 Tileston Street, Boston, during the week of February 12, 1912.

There will be a two-hour lesson twice each week.

Employers give this opportunity to their help during working hours without loss of pay.

The instruction will consist of lessons in plain cooking, marketing, home

furnishing and decoration, care of the home, household economy, selection and care of clothing, personal and home hygiene, and general efficiency.

An apartment has been secured and equipped especially for this purpose.

Boston is thus meeting a real need in the establishment of these schools. They are schools for working people, held during business hours, in the locality of their employment, affording opportunity for instruction under the most favorable conditions. A maximum number is served at a minimum waste of time in travel; a close specialization of subjects is possible; the pupil is continually applying the theory of the classroom to practical problems in the store or factory; and the instruction satisfies the needs of the pupil's greatest and most vital interest, for it is enlivening and dignifying his daily task. The youth is not preparing for some indefinite job that he may never get; he has the job already, and he aims to increase his efficiency in that position. He is not accumulating knowledge that will be forgotten before he has a chance to apply it; he is learning the meaning of problems and conditions which are being worked out about him on a commercial basis day by day. He sees the relation of his duties to the industry as a whole, and he finds in the school an avenue of self-expression where he feels that he can show his ability.

COURSES OF STUDY

Shoe-and-Leather School

The production and distribution of leather; tanning process; leather manufacture; recognition of kinds, grades, and comparative values of leather; manufacture and classification of shoes; salesmanship; efficiency training; visits to industrial plants.

Dry-Goods School

Fibers; cotton and cotton goods; wool, worsteds, and woolens; silk and silk fabrics; linen and linen fabrics; recognition and comparison of mixed fabrics; simple tests for determining quality; coloring materials and color preservation; shrinking; mercerization; noninflammable fabrics; care of stock; commercial arithmetic; commercial geography; commercial correspondence; salesmanship; efficiency training.

Preparatory-Salesmanship School

Commercial correspondence; facility in oral and written expression; store arithmetic; sales-slip practice; sources of merchandise and its distribution; raw materials; textiles; penmanship; color and design; hygiene; practical talks on the fundamental principles of success; salesmanship.

Banking School

Brief history of banking; different classes of banks and their relation to each other; department work; correspondence; notes, — usury, protest, discount; currency; foreign monetary systems; circulation; credit; clearing houses; stocks and bonds; brokers; the Stock Exchange; foreign and domestic exchange; funds and funding systems; efficiency training.

The length of the courses at the present time is fifteen weeks, and two courses are given each year. The first opens early in October and the second in the middle of February.

Pupils from retail stores usually have their sessions in the morning from 8.30 to 11.00 o'clock; pupils from the wholesale stores usually have their sessions in the afternoon from 3.30 to 5.30 o'clock.

CHAPTER XVI

VOCATIONAL GUIDANCE

Vocational guidance will, of necessity, follow closely upon the introduction of vocational education, and the ultimate success of either one will depend in no small degree upon the ability of the school system to furnish some measure of the other.

The first school system in the country to attempt to fulfill this new function of education, at least in a systematic way, was that of Boston. At the First National Conference on Vocational Guidance, held in Boston, November, 1910, Mr. Stratton D. Brooks, then superintendent of public schools, described the purpose and the methods of the work thus far accomplished. The complete paper is given below.

The Vocation Bureau to which Mr. Brooks refers was founded by Mrs. Quincy A. Shaw in January, 1908, on plans drawn up by the late Dr. Frank Parsons. Dr. Parsons's book "Choosing a Vocation," and a volume by Meyer Bloomfield, the present director of the bureau, entitled "The Vocational Guidance of Youth," will be found of great value to students of this new movement.

Referring again to the fact that this work was made possible by the generosity of Mrs. Shaw, one must recall the active part taken by this wise philanthropist in the establishment of the kindergartens in the United States, and her later support of the sloyd movement, which so profoundly modified manual training throughout the country. It seems probable that this latest addition to the duties of the schools will ultimately produce as radical modifications in their methods and ideals as have resulted from the introduction of the kindergarten and manual training.

VOCATIONAL GUIDANCE[1]

BY STRATTON D. BROOKS

Formerly Superintendent of Public Schools, Boston, Massachusetts

At the outset I wish to distinguish between vocational placement and vocational guidance. By vocational placement I mean fitting a job to the attainments that a boy now has. By vocational guidance I mean fitting a boy to a job that he will at some future time be able to fill, if he follows the course of instruction outlined by his vocational adviser. Vocational placement finds a job now better fitted to the boy's present attainments than he would otherwise be likely to find. Vocational guidance fits the boy for a better job in the future by training him along the lines of his greatest aptitudes and opportunities. Both consider the boy's abilities: one for the purpose of making the best possible present use of them; the other with a view to giving them additional development, in order to secure in the future a still greater use of them. It is this latter phase of vocational guidance that is discussed here.

Educational methods and educational machinery are being overhauled in the light of a new purpose, namely, the more specific preparation of pupils for particular vocations in life. The most important immediate effect of the movement for industrial education has been to move forward suddenly the time of choice, and it is this necessity to choose early a definite career that renders desirable a consideration of vocational direction.

The schools of the past have presented the same type of education for all pupils, and vocational direction consisted mainly in advising a boy to take or not to take additional education. But under the new conditions, vocational direction will not only be concerned with advising a boy to take additional education

[1] Read at the First National Conference on Vocational Guidance, Boston, November, 1910.

but with deciding what particular kind of additional education he should take in order to be of greatest service to himself and to the community.

Formerly a teacher might, with a clear conscience, advise a boy to take a high-school course, or go to college even, to prepare for medicine or law, for the education offered in high school or college was so general in character and so wide of application that, whatever the boy's future vocation, he was almost sure to succeed better in it because of his extended training. Furthermore, the final entry into the medical school or the law school came at so late a date that any change of interest or error in the estimate of the boy's ability had time to show itself. But he who in these days of special education advises a boy to enter some particular trade, and selects for him a course of study restricted to the practical elements of that trade, may not give advice lightly, for the possibilities of error are increased a hundredfold, while the possibilities of correcting an error, if made, are almost nonexistent.

The new element in the situation, and the one that causes the chief difficulty, because of the establishment of specific industrial schools, is that the avowed purpose of industrial education is to prepare for a specific end, and in order to be valuable and effective to that end it must be restrictive in nature. Cultural education is criticized because, though good, it is not good for anything particular, while industrial education is praised because it is not only good, but good for something. When considered from the point of view of vocational advice, however, the chief trouble is that industrial education, though good for something, is only good for some *one* thing; and in proportion as it succeeds, it limits, for the boy or girl who receives it, the possibility of success in any other line of endeavor. He who enters upon a successful industrial training, especially of the lower and more specific type, becomes by that very education

less fitted for entrance upon a different work. In case events show that the boy is not qualified for the work selected, there is little opportunity to correct the error. To advise a boy to take up a restrictive educational course is a matter requiring much graver consideration than to advise him to take a non-restrictive course; and vocational direction, therefore, attains an importance that it has not hitherto had.

The chief motto of vocational direction in the past has been, "Aim at the highest." There are those who call our present educational system a failure, on the ground that we have attempted to educate every boy to become a president of the United States. But the man who should seriously criticize the school for stating as its aim the education of presidents would fail to recognize that the statement is but the embodiment of the general principle that every boy shall have the incentive and the opportunity to reach the highest development of which he is capable. It will be unfortunate indeed when American education ceases to encourage every one to take active part in democratic citizenship, and to feel honored by the opportunity to render public service. It is undoubtedly true that intellectual superiority has received greater recognition in the schools than mechanical skill; but it is also true that the same difference has existed in the world at large, and that it will probably continue to exist.

To-day we face a new situation. The demand for more skillful workmen is upon us, and the people are asking the schools to solve the question. What I want to keep clearly in mind, however, is that this ought not to be a demand for a *substitute* education but for a *supplementary* education; that the error of the school in the past in pointing every pupil toward academic callings would be repeated in even a worse way if it should now attempt to place every boy in a mechanical trade.

There is less danger to society from men who have aimed high and failed because of their own lack of ability, than there is

from able and ambitious men who writhe under an apparently unjust discrimination of society that gives greater rewards to other men naturally no more richly endowed.

But whether we favor or disapprove, it seems evident that industrial education will go forward, and that in the larger cities, at least, separate schools will undoubtedly be established, wherein each class of pupils may receive whatever type of elementary industrial instruction the combined wisdom of the citizens, the school committee, and the teachers determine to be best suited to the purpose in hand. The introduction of separate schools will bring upon the American people a new and serious problem, namely, the necessity of an early choice of a vocation. Reliable information and competent advice must be furnished, both to children and to adults, showing what vocations are open to children, what conditions prevail in each, and what the rewards of success may be.

In view of these needs, we have been endeavoring in Boston to establish vocational direction on a satisfactory foundation. I wish to state briefly what has been attempted.

Boston is fortunate in having a group of liberal-minded men and women through whose generosity the Vocation Bureau has been established and maintained. The Boston School Committee has invited the coöperation of the Vocation Bureau, and the director of this bureau has worked hand in hand with the Vocation Direction Committee of the Public Schools — a committee appointed by the superintendent and consisting of masters and submasters in the Boston schools. Among the many activities of the Vocation Bureau, I mention three: first, the investigation of conditions in the trades and businesses of Boston. The bureau has undertaken to prepare material for the use of pupils, parents, and vocational counselors, that will furnish the best available information with reference to the vocational opportunities that exist in Boston. Second, the Vocation

Bureau is conducting in one of the public-school buildings a school for vocational counselors, wherein teachers and others who are interested in this important work may prepare themselves for the better performance of their important tasks. Third, the Vocation Bureau has brought about a coöperation of effort whereby various organizations have undertaken to perform needed services without duplication of effort.

An important part of the question of vocational selection is the amount of interest and attention that parents must give. To this problem of arousing an interest in parents, the School and Home Association has agreed to devote especial attention. By means of discussions before the Parents' Associations, of which it is composed, this society will be able to do much to create a widespread and intelligent interest in the problem.

It is necessary also that accurate information be gathered with reference to the specific instruction offered in day and evening schools, both public and private. The Women's Municipal League has undertaken to collect this information and to set it forth definitely and concisely in the form of printed charts.

To the work of giving vocational advice to girls who have left school, the Girls' Trade Education League will give special attention.

In the schools themselves many things have been done at the suggestion of the Committee on Vocational Direction, chief among which is the appointment in each high school and elementary school of one or more vocational counselors. These counselors have been selected by the principals with reference to their interest in the work of vocational direction, their skill in determining the abilities and possibilities of the children, and their willingness to devote extra time to acquiring information and perfecting themselves for the successful performance of their duties. Meetings of these counselors have been held for the

purpose of discussing the problems of vocational direction and considering how best to minimize its dangers and increase its beneficial results. Most of them are now taking a course of instruction arranged by the Vocation Bureau, wherein they may be even more efficiently prepared for the work of directing pupils wisely. As an illustration of the work of these vocational counselors the following will serve:

Last June twice as many elementary-school graduates as could be admitted elected the High School of Commerce and the High School of Practical Arts. Hitherto when. similar conditions have arisen it has been necessary to choose the half that could be admitted either by lot or on the basis of scholarship. This year the existence of the vocational counselors rendered possible a different and a better procedure. The principal of each elementary school was sent a list of the boys in his school who had applied for admission to the High School of Commerce, with the statement that only half could be admitted. The request was made that the vocational counselor of the school select that half. The principal of the High School of Commerce met the vocational counselors, explained the special work done in that school, and outlined the qualities that a boy must possess in order to succeed therein. The vocational counselors then approached the question of choosing the boys to be admitted, having on the one hand some knowledge of the special qualities needed in that particular school, and, on the other hand, a knowledge of the tastes and aptitudes of the boy as shown by his work in the elementary school. The boys chosen by the vocational counselors were then admitted. A similar course was pursued with girls for the High School of Practical Arts, and it is hoped that this process of selection has brought into these schools a higher percentage of pupils fitted to do the work therein than could have been secured by either of the methods previously pursued.

Somewhat different and less difficult than the problem of selecting a school is the work done in specific vocational schools, as illustrated in the High School of Commerce and the Trade School for Girls.

Since the High School of Commerce was organized in 1906 systematic instruction has been given with reference to existing business opportunities and the possibilities of each. Carefully prepared courses of lectures, based on accurate investigations of conditions in Boston and elsewhere, have been presented each year. The whole atmosphere of the school has been permeated with the idea of choosing wisely some particular business. The purpose of the school is not only to fit the boy for a commercial career, but to find that particular commercial career in which he gives promise of the greatest progress. In order to assist in the process of fitting each boy to his business, a system of summer apprenticeship has been established. Prior to the summer vacation in 1909, and again in 1910, the School Committee appointed a man to have charge of the work of finding employment for the high-school boys during the summer in the business houses of the city. The business men have coöperated heartily in the plan. They agree to give the boys the best possible chance to obtain a knowledge of the business and demonstrate their own fitness or unfitness for it. In particular, they agree not to hire the boy after school opens in September, even though he has shown special aptitude for the work in hand. By this means the business men have a sympathetic understanding of the aims of the school, the school appreciates more thoroughly the demands made upon the boys who enter business, and the boys obtain some insight into the relation of their school tasks to their life work.

In the Trade School for Girls provision is made for a *vocational assistant* for each hundred girls. The school teaches certain trades, and the vocational assistant is charged with the duty of investigating conditions existing in these trades, in order to

enable the school to adapt its course to the exact needs of business, and to provide accurate and up-to-date information available for use of parents and pupils.

It is the business of the vocational assistant to secure positions for graduates, and in this sense she conducts an employment bureau, but with the important difference that she knows both the conditions in the trade and the qualifications of the particular girls, and therefore endeavors not merely to find a place for the girl, but a place where she will succeed. The work of the vocational assistant, however, but begins with finding a place for the girl. It is success that counts, and the vocational assistant is to keep track of her girls, know which ones succeed, and, more especially, which ones fail, and why they fail; she is to find for those who fail other places better suited to their abilities, or perchance advise them to return to school until they reach a degree of proficiency that will enable them to retain a position once obtained.

On the moral side, also, the vocational assistant will have great effect. Before the girl leaves school it is hoped that such a mutual relation of confidence and friendship will be established that any girl who finds herself at work in a shop or factory where conditions are improper will report promptly to the vocational assistant, with the result that the girl will be placed in another position, and that no more girls will be sent to the shop or factory complained of until conditions are improved. When, perchance, a girl is placed in a position in which she cannot advance, or from which she is discharged, the vocational assistant should be on hand to encourage and assist, to tide the girl over the immediate difficulty, and to find for her some other work wherein there is prospect of earning a living wage and of meeting a greater measure of success.

In both of these schools it will be observed that the problem is that of selecting a particular business or trade within a

comparatively limited range from which the pupil, by entering the school, has elected to choose. Much broader and far more difficult is the task of selecting the particular school to which a boy or girl should go, or of deciding on the specific calling that he should enter on leaving a school that has given him only a very general preparation. It is in this field that vocational direction will be most necessary and should ultimately succeed in reaching its greatest usefulness.

To secure information that is accurate is comparatively easy, but to give advice that is wise with reference to selecting a life calling is most difficult. He who gives advice must know not only the relative advantages of the different trades, businesses, and professions, but also the specific requirements for success in each. To determine what callings give greatest financial returns, and to advise all pupils to seek those callings, would be to ignore the element that will make advice valuable, namely, the careful consideration of the tastes, tendencies, and abilities of the pupils, in order that each may be advised to select a calling in which the requirements for success are such that he may have reasonable expectation of meeting them. The vocational adviser must know business, to be sure, but he has much greater need to know boys.

It is evident that a vast amount of scientific investigation must be made before any form of vocational advice can have any substantial and reliable scientific foundation. Outside of such elements as courtesy, tact, perseverance, courage, honesty, and the like, the factors that are really essential in any single business are as yet undetermined. The extent to which success in each calling depends upon the strength or accuracy of muscular reaction, upon the pertinacity and rapidity of mental associations, or upon any one of a dozen other lines of mental and motor activity, still awaits solution in the laboratory of the experimental psychologist. More difficult still is the determination of the

exact qualifications of each particular boy; impossible, in fact, under any system of investigation that now exists or is likely to exist under conditions that will be readily applicable to thousands of children annually. When to these difficulties is added that of determining now, with a boy in the adolescent period of rapid and turbulent change, what will be his dominant, permanent characteristics when he has reached manhood, it becomes clear that even under the most careful guidance the giving of vocational advice must still remain in the realm of the uncertain and problematical.

To give advice as to selection of a life work must remain for the most part an appreciative art rather than an exact science. It will depend upon those attitudes of mind that are appreciative and interpretative, rather than upon those which are analytical and scientific. Both the parent and the expert vocational adviser are likely to be in error; the parent because he is too near the life of the boy, knows him too intimately, loves him too well, and is too strongly prejudiced in his favor and too prone to exaggerate both his minor faults and his minor virtues, to enable him to judge with all wisdom as to the present condition or future promise of his child; the psychological expert, because he is too far from the child, too unacquainted with his attitudes of mind, his reactions under the stress and irritations of life conditions, too remote to receive the shy confidences of a fleeting moment when the child lifts but for a second the veil that covers many latent possibilities. Between the parent and the expert adviser, however, is the teacher, who possesses or should possess some of the characteristics of each. I do not mean that there is little use for expert vocational advice, but merely to emphasize that its greatest work must be done by utilizing as its agents those who now furnish, and who will continue to furnish, ideals, incentives, and directions to a majority of all the pupils in school.

Plan of the Central High School
Grand Rapids, Michigan

Unquestionably the widening of educational opportunities has forced upon principals and teachers generally the necessity of guiding their pupils to make a wise selection among the schools and courses of study which offer such a variety of possibilities. In individual instances counsel has been given with full recognition of the value of vocational motive, but in few schools has any effort been made to reduce this counseling to a system or to develop it as an art.

Principal Jesse B. Davis, of the Central High School, Grand Rapids, Michigan, has developed in his school a plan based on the conception that vocational vision can be created and developed by education, and that this particular kind of education the schools should give. The plan was fully set forth in a paper[1] read by Mr. Davis in 1911. In it he discussed the need for vocational education and vocational guidance, and made excellent suggestions relating to possible guidance below the high school, emphasizing, it is true, the need of *giving information about* vocational life, rather than the need of *developing appreciation of it* through *actual contact with its elements*. The complete plan for the high school follows.

A STUDY OF CONDITIONS

In talking with the pupils about to enter the high school from year to year, I have found that it is a rare thing for pupils to have any definite idea of a plan for their future. They have great difficulty in choosing a course of study in the high school. The choices made are often influenced by the merest whims, by parents' or teachers' hobbies, by companions' choices, or by hearsay evidence that certain subjects are hard or easy. After entering the high school many pupils have come to the office to obtain permission to drop a certain study, because they have found it to be something different

[1] The paper will be found in full in the proceedings of the 1911 meeting of the North Central Association of Colleges and Secondary Schools. The descriptive portions only are here given.

ɔm what they thought it was when they decided to take it. An elective stem gives rise to much harmful changing about by students who have aim in their study. I have also found that students will decide the question of going to college or into business with just about as much judgment they use in electing courses upon entering the ninth grade. But few of em are serious-minded enough to consider carefully the kind of work that ey should take up in college.

In order to obtain a more definite idea of the actual situation in the high hool itself, I made a special study of 531 cases. These boys were asked answer a number of questions as honestly and as carefully as they possibly could. I have every reason to believe that the results obtained are as curate as is the judgment of the average high-school boy. Of the 531 ys in all grades of the high school, 240 had decided upon some vocation. om the 291 who had not arrived at any decision in the matter, 194 had ed to do so, while 97 boys had made no effort at all; 235 of these said at they would like to have advice on the subject, leaving 56 who were parently indifferent to the question. A further study of the 240 who had ide a decision gave still more interesting data. In asking them how they me to make this decision, and by whom they were influenced in making e choice, I found that 105 cases were practically settled by parents; so the teachers had influenced only 26, companions had led 33 to do as ey were going to do, 59 had chosen a certain vocation because some relve or friend in the occupation had made it attractive for them, and 23 ys had arrived at their conclusion without the aid of any one. This oved that the parents were the dominating factors, that the teachers were t making full use of their opportunity, and that many pupils were making e decisions without any proper guidance or influence. I asked what knowlge they had of the vocation they had chosen, and found that 47 of them d worked during vacations or at other times in the occupation they had cided upon; 34 knew something about the vocation because their parents d relatives were in it; 36 had spent some time reading and studying about eir choice; and 123 confessed that they had no real knowledge of the cation that they had determined to enter. Of the 240 I found that 150 ere choosing their studies in accordance with a plan to prepare for their e work, and that 90 were still drifting along without any idea of how ey might best realize their ambition. I asked what purpose they had in ind in choosing a particular vocation. One answered for "service"; 19 ere after "money"; 85 merely "preferred" or "liked" that one best;) really thought they were better "fitted" for it than anything else; 19 ished to enter the same work with their parents; and 77 could think of o purpose in particular except to make a living.

A study of choices that were made by the 240 boys gave evidence of a rather narrow vision of the world's work, only 30 different vocations being named. About one third of all the boys were going to be engineers of some kind, 22 were looking toward the law, 12 had decided to take up farming; of course there were a number in Grand Rapids who were interested in manufacturing, but the others were scattered among the most familiar occupations. Most teachers of mathematics would agree that of the 73 who had chosen engineering, a good number could be wisely guided into different lines by an investigation of their ability in that subject.

Altogether the investigation gave much evidence of a need of better guidance, and this evidence, together with the knowledge that the pupils who have a definite aim actually do a much higher grade of work than those who are drifting along the path of least resistance, led us to determine on a scheme of guidance which we have now learned to call "vocational."

From my investigation of the influences that determine the choice of the high-school boy, I realize the need of instructing the parents as well as the pupils. Nearly all of our grammar schools have organized parents' clubs. The progress of the movement to make the schoolhouse a social center is also opening the way for splendid opportunities to educate the parents in the art of wise guidance, and is bound to promote a more healthful coöperation between parent and teacher. We have published a little pamphlet addressed to the parents of the eighth-grade pupils in regard to the advantages of a high-school education, and as a guide in choosing studies upon entering the high school. Other pamphlets are in process of preparation. These will be on vocational topics, and largely for the benefit of those who cannot go on immediately with their education, but who must find some kind of employment.

GUIDANCE IN THE HIGH SCHOOL

Vocational guidance is, or should be, a process of drawing out from a pupil a knowledge of himself, of opening his eyes to see the wide field of opportunity that is before him, and of developing in him the elements of character that make for a successful life. It is then a problem of self-development and not a matter of mere information or of the giving of advice. Following out this theory, we have selected in the high school the department of English for the purpose of experiment. In this subject we reach every pupil, and at the same time offer the students subjects for composition that are of real interest to them and about which they have some ideas of their own. The aim of the arrangement of themes will be seen from the following scheme:

Ninth grade, first semester. Autobiographical themes.

1. The family. 2. My health. 3. The record of a day. 4. My habits. 5. My likes and dislikes. 6. The most important event in my life. 7. My ambition. 8. My church. 9. A self-estimate.

Ninth grade, second semester. Biography.

1. (Franklin, etc.) at my age. 2. How (Edison) succeeded. 3. My opportunities compared with those of (Lincoln). 4. Have I some qualities found in (great men)?

Tenth grade, first semester. The world's work.

1. The kind of employment that I can get now. 2. Child labor. 3. Wages of those leaving school at the eighth grade compared with high-school graduates. 4. Different vocations selected and assigned by the teacher.

Tenth grade, second semester. My vocation.

1. Why I have chosen my vocation. 2. Interview with a successful man or woman in the vocation. 3. Plan for entering this vocation.

Eleventh grade, first semester. Elements of success (character).

1. What are business habits? 2. Character *vs.* reputation. 3. The effect of overcoming bad habits. 4. The manly man. 5. Which has the greater effect on your character, your environment or your associates? 6. What kind of an employee does the business man want? 7. What elements of character are demanded by my vocation?

Eleventh grade, second semester. Elements of success (duty and obligation).

1. Keeping faith with self and with others. 2. One's duty toward parents, friends, and employer. 3. Discuss "Fidelity is seven tenths of business success." 4. Am I the architect of my own character? 5. What is the reward of duty done? 6. Does my vocation impose upon me any duty or obligation?

Twelfth grade, first semester. The individual and society.

1. Why should I be interested in the following: (*a*) the public schools; (*b*) social settlements; (*c*) charity organizations; (*d*) religious societies? 2. My vocation in the community. 3. My avocation. 4. What could I do if my vocation were taken from me?

Twelfth grade, second semester. Citizenship.

1. What is public spirit? 2. What is my duty to the state? 3. Why obey the law? 4. Why be honest in business? 5. Should business interfere with public welfare? 6. The right use of money.

These suggested themes are merely types to show the aim of the work. Teachers who are in sympathy with the plan will readily work out their own ideas. The pupils themselves will also suggest many profitable studies. The one thought of preparation for life and life's work through the chosen vocation should be the dominating purpose underlying the whole scheme.

VOCATIONAL RECORD CHARTS

To make use of the valuable material gained through the written themes and personal conferences with the teachers of English, a plan for recording the information relating to vocational guidance has been devised. Naturally the first record desired is from the grammar school, to be used as a guide if the pupil enters the high school, or to be kept by the grammar-school principal who wishes to follow up those who have entered industrial life. The following card is suggested for this purpose.

Vocational Record for the Eighth Grade

Name____________________Age____Date of graduation__________

Parent's name____________________Address____________________

Parent's occupation____

Vocational Influence of

Family____________________Health____________________

Habits____________________Ability____________________

Experience____________________Peculiarities____________________

Character____________________Leadership____________________

Stability____________________Vocation____________________

Teacher's opinion____

____

Teacher______________________________

When a pupil has entered the high school a regular scholarship record is kept by means of a large card nine and one-half inches by twelve inches. On the back of this card is recorded the progress made by the pupil in development of character and vocational tendencies. The information received from the eighth grade is affixed or transferred to this card. At the end of each semester the teacher of English and the session-room teacher add to the record such data as, in their judgment, may be of future value in giving advice or in making recommendations. The reverse side of the record card is prepared as shown below.

Student Vocational Record

________________Grammar school________________

from eighth grade________________________________

____

____

teacher, ninth grade, first semester________________________

____

room teacher______________________________________

____

teacher, ninth grade, second semester_______________________

____

e forms and spaces are continued for the four years of the high ourse. All records are kept in the vault of the school and are not o the pupils.

Reverse of Regular Scholarship Record Card

VOCATIONAL RECORD

________________Parent's vocation________________

r	Plans for future	Ability	Personal history	Character	Teacher

card the spaces of these columns are of equal width. The card is l one-half inches by eleven and three-quarters inches.

:s of record under the above headings are indicated below. All ion of value in vocational guidance should be recorded.

Plans for future. Vocation, college, employment, etc.
Ability. Special aptitude, initiative, skill, capacity, efficiency, etc.
Personal history. Home, health, travel, employment, etc.
Character. Honesty, perseverance, promptness, stability, habits, etc.

REMARKS

SCHOOL COUNSELORS

The Grand Rapids High School is organized with six session-room teachers, who are in fact assistant principals. They are in full charge of about two hundred fifty pupils each, and all matters of scholarship and petty discipline are within their jurisdiction. These teachers form a sort of cabinet for the principal in directing the work of the pupils, and are therefore well situated to act as vocational counselors. The problems of choice of studies, of keeping up the daily work, and of discipline, offer them opportunities for vocational guidance that many times bring immediate results. These teachers have not more than three recitations a day, so that they have the time and opportunity to talk with the pupils. At the beginning of each semester these teachers examine the records on the cards just described. They add the experience of that semester, and so the data are gathered for use as they may be needed in giving advice or in making recommendations for college or for business positions. This system places at the disposal of the principal, who is the chief counselor, the combined judgment of a dozen or more teachers, each of whom has had a special opportunity to study the pupil. At this point in the work of guidance the school has done about all it can without the coöperation of those who are to receive the product of their efforts.

THE FUNCTION OF THE VOCATION BUREAU

The whole problem of vocational guidance is primarily educational. It belongs to the school as a legitimate part of its work just as positively as the teaching of any subject in the curriculum. As was said earlier in this paper, we have worked out a fairly satisfactory adjustment of the relations between the public school and the higher institutions of learning, through many years of conference and coöperation. Now we must pursue the same methods of conference and coöperation with the men who are directing the business institutions into which our pupils are to enter, as we have in the past with the university and college men.

If all this is to be done successfully, we must have the aid and counsel of successful, educated business men and women. This is the chief function of the so-called Vocation Bureau. In each city, through the coöperation of the Board of Education and the Board of Trade or Commerce, a commission of interested citizens should be appointed, to counsel with the school authorities in the solution of all these problems. The right kind of citizens on such a bureau will lend power to the movement and will make it possible to carry out the plans that may be formulated.

However, I wish to emphasize the principal thesis of this argument, that the movement for vocational guidance is strictly an educational function. For this reason it belongs to the schools as a formal part of their work, and should be directed by the authority of the local Board of Education. With this central authority the work can be conducted with greater harmony, and more effectual results can be obtained. The vocational counselor should logically be a member of the school system, in touch with all its departments and as near to the lives of the pupils as possible. The principal of the school from which the pupils go out into the world is their natural counselor. I do not approve of the idea of making the work of vocational counseling a "new profession." It is merely the broadening out of the opportunity and duty of the school principal. It seems to be a very logical way of meeting the demand that is being made on the public schools for a better preparation of our boys and girls.

The Grand Rapids Public Library, coöperating with the school authorities, published in its *Bulletin* of October, 1911, the following list of books, together with the outline of the plan by Principal Davis.

VOCATIONAL GUIDANCE

Outline of the course of study in the Central High School, with a selected list of books in the library for teachers and pupils

INTRODUCTORY NOTE

The following list of books on vocational guidance is published in order that the work of the library in meeting requests for books on this subject may be facilitated. It is a selected list only, and there has been omitted from it the whole of the immense amount of material that is to be found in the reference department, chiefly articles in magazines, all of which are readily available through Poole's Index and other indexes. There are included in the following list books for the teacher as well as for the pupil.

In order that those who use the list may have a better understanding of the purpose of vocational guidance as carried on in the Central High School of Grand Rapids, the principal of the school, Professor Jesse B. Davis, has kindly prepared the following brief statement of the aims of this work and the outline of the course of study. The books are arranged with reference to this outline.

Outline of Work in Vocational Guidance in the Central High School

By Jesse B. Davis, Principal

Vocational guidance aims to direct the thought and growth of the pupil throughout the high-school course along the line of preparation for life's work. The plan is intended to give the pupil an opportunity to study the elements of character that give success in life, and, by a careful self-analysis, to compare his own abilities and opportunities with those of successful men and women of the past. By broadening his vision of the world's work, and applying his own aptitudes and tastes to the field of endeavor that he may best be able to serve, it is attempted to stir the student's ambition and to give a purpose to all his future efforts. Having chosen even a tentative goal, his progress has direction. In the later study of moral and social ethics he has a viewpoint that makes the result both practical and effective.

In order to reach all the pupils in the high school this work is carried on through the department of English, which subject all pupils must take. Brief themes and discussions form the basis of the work. Pupils are directed in their reading along vocational and ethical lines, and are advised by teachers who have made a special study of vocational guidance. The following outline is but suggestive of the type of themes and discussions to be used. Each teacher is given opportunity to use her own individuality in working out the details of the scheme.

Outline

First Year

First semester. Elements of success in life.

1. Everyday problems.
   (*a*) The school; (*b*) the home; (*c*) the athletic field; (*d*) the social group.
2. Elements of character.
   (*a*) Purpose of life; (*b*) habit; (*c*) happiness; (*d*) self-control; (*e*) work; (*f*) health.

Second semester. Biography of successful men and women.

1. Character sketches.
2. Comparison of opportunities of —— with self.
3. Comparison of qualities of —— with self.

Second Year

First semester. The world's work.

1. Vocations — professions, occupations.
2. Vocations for men.
3. Vocations for women.

Second semester. Choosing a vocation.

1. Making use of my ability.
2. Making use of my opportunity.
3. Why I should like to be ——.
4. The law of service.

Third Year

First semester. Preparation for life's work.

1. Should I go to college?
2. How shall I prepare for my vocation?
3. Vocational schools.
4. How shall I get into business?

Second semester. Business ethics.

1. Business courtesy.
2. Morals in modern business methods.
3. Employer and employee.
4. Integrity an asset in business.

Fourth Year

First semester. Social ethics: the individual and society (from the point of view of my vocation).

1. Why should I be interested in (*a*) public schools? (*b*) the slums? (*c*) social settlements? (*d*) public charities? (*e*) the church? (*f*) social service?
2. The social relation of the business man.

Second semester. Social ethics: the individual and the state (from the point of view of my vocation).

1. The rights of the individual.
2. Protection to the individual from the state.
3. The obligations of citizenship.
4. The rights of property.
5. The responsibility of power.

FIRST YEAR — FIRST SEMESTER

Elements of Success in Life

ADAMS, W. H. D. The Secret of Success. 1879.

BABCOCK, M. D. The Success of Defeat. 1905.

BENNETT, ARNOLD. How to live on Twenty-four Hours a Day. *c.* 1910.

BRENT, C. H. Leadership. 1908.

CALL, ANNIE P. Everyday Living. *c.* 1906.

FOWLER, N. C. Starting in Life. What each calling offers ambitious boys and young men. 1907.

GILMAN, N. P., and JACKSON, E. P. Laws of Daily Conduct, and Character Building. *c.* 1891.

GRANT, ROBERT. Search-Light Letters. 1899.

GRIGGS, E. H. The Use of the Margin. 1907.

GULICK, L. H. The Efficient Life. 1907.

GULICK, L. H. Mind and Work. 1908.

HARDWICKE, HENRY. The Art of getting Rich. *c.* 1897.

HIGGINSON, T. W. Things worth while. 1908.

HILTY, CARL. Happiness, Essays on the Meaning of Life. 1903.

HUBBARD, ELBERT. A Message to Garcia. *c.* 1900.

JORDAN, W. G. The Kingship of Self-control. Individual problems and possibilities. 1901.

KELLOR, FRANCES A. Out of Work. A study of employment agencies, their treatment of the unemployed and their influence upon homes and business. 1904.

KNOWLSON, T. S. The Art of Success. 1902.

KNOX, G. H. Ready Money. 1908.

LECKY, W. E. H. Map of Life. Conduct and character. 1900.

LORIMER, G. H. Letters from a Self-made Merchant to his Son.[1] 1902.

MACCUNN, JOHN. The Making of Character. Some educational aspects of ethics. 1900.

MARDEN, O. S. Architects of Fate; or, Steps to Success and Power. 1896.

MARDEN, O. S. The Making of a Man. 1905.

MARDEN, O. S. The Optimistic Life; or, In the Cheering-up Business. 1907.

MARDEN, O. S. Pushing to the Front; or, Success under Difficulties. 1896.

MARDEN, O. S. The Secret of Achievement. *c.* 1898.

MARDEN, O. S. Success. A book of ideals, helps, and examples for all desiring to make the most of life. 1897.

[1] Letters of advice concerning a business career; full of humor and sound sense.

MARDEN, O. S. Winning Out. A book for young people on character building by habit forming. *c.* 1900.
MARDEN, O. S. The Young Man entering Business. *c.* 1903.
MARDEN, O. S. (ed.) Talks with Great Workers. *c.* 1901.
MATHEWS, WILLIAM. Conquering Success; or, Life in Earnest. 1903.
MATHEWS, WILLIAM. Getting on in the World; or, Hints on Success in Life. *c.* 1872.
SANGSTER, MARGARET E. Life on High Levels. Familiar talks on conduct of life. 1897.
SMILES, SAMUEL. Self-help, with Illustrations of Character. 1859.
VAN DYKE, HENRY. The School of Life. 1905.
WAGNER, CHARLES. On Life's Threshold. Talks to young people on character and conduct. 1905.
WHIPPLE, E. P. Success and its Conditions. *c.* 1871.

FIRST YEAR — SECOND SEMESTER

Biography of Successful Men and Women

ADDAMS, JANE. Twenty Years at Hull House. 1910.
BALFOUR, GRAHAM. Life of Robert Louis Stevenson. 1901. 2 vols.
BALLOU, M. M. Genius in Sunshine and Shadow. 1886.
BLACKETT, HOWARD. Life of Giuseppe Garibaldi. 1888.
BOLTON, SARAH K. Famous Givers and their Gifts. *c.* 1896.
BOLTON, SARAH K. Famous Leaders among Men. *c.* 1894.
BOLTON, SARAH K. Famous Leaders among Women. *c.* 1895.
BOLTON, SARAH K. Famous Types of Womanhood. *c.* 1892.
BOLTON, SARAH K. Famous Voyagers and Explorers. *c.* 1893.
BOLTON, SARAH K. Lives of Girls who became Famous. 1886.
BOLTON, SARAH K. Successful Women. 1888.
BROOKS, E. S. Great Men's Sons. Who they were, what they did, and how they turned out. 1895.
CLEMENS, W. M. Theodore Roosevelt, the American. *c.* 1899.
CRAIK, G. L. The Pursuit of Knowledge under Difficulties. New edition, revised and enlarged. 1865.
CURTIS, W. E. The True Abraham Lincoln. 1903.
DAVIS, R. H. Real Soldiers of Fortune. 1906.
DRAKE, S. A. (ed.). Our Great Benefactors. 1884.
FERRIS, G. T. (ed.). Great Leaders. Historic portraits from the great historians. 1889.
FORD, P. L. The Many-Sided Franklin. 1899.
FORD, P. L. The True George Washington. 1896.

FRANKLIN, BENJAMIN. Autobiography. *c.* 1896.
GILCHRIST, BETH B. Life of Mary Lyon. 1910.
GORDON, ANNA A. The Beautiful Life of Frances E. Willard. *c.* 1898.
HALE, E. E. (ed.). Lights of Two Centuries.[1] 1887.
HARRISON, J. A. George Washington, Patriot, Soldier, Statesman. 1906.
HOUGHTON, W. R. Kings of Fortune; or, The Triumph and Achievements of Noble, Self-made Men. 1888.
KELLER, HELEN. Story of my Life. 1903.
LAWRENCE, WILLIAM. Phillips Brooks. 1903.
McCABE, J. D., JR. Great Fortunes and how they were made. 1870.
MARDEN, O. S. How they succeeded. Life stories of successful men told by themselves. 1901.
MORGAN, JAMES. Theodore Roosevelt, the Boy and the Man. 1907.
MORRIS, CHARLES. Heroes of Progress in America. 1906.
NEIL, SAMUEL. Epoch Men, and the Results of their Lives. 1871.
PALMER, G. H. The Life of Alice Freeman Palmer. 1908.
PARTON, JAMES. Captains of Industry; or, Men of Business who did Something besides making Money. 1885. 2 vols.
PARTON, JAMES (ed.). Some Noted Princes, Authors, and Statesmen of our Time. 1885.
POLLARD, ELIZA F. Florence Nightingale.
RAYMOND, R. W. Peter Cooper. *c.* 1901.
RIIS, JACOB A. The Making of an American. 1901.
RIIS, JACOB A. Theodore Roosevelt the Citizen. 1904.
ROTHSCHILD, ALONZO. Lincoln, Master of Men. A study in character. Anniversary edition. 1908.
SCHUCHHARDT, CARL. Life of Dr. Schliemann.
SMILES, SAMUEL. Industrial Biography. Ironworkers and toolmakers. 1863.
STODDARD, W. O. Men of Business. 1893.
STOWE, HARRIET B. The Lives and Deeds of Self-made Men. New edition, revised. 1889.
TARBELL, IDA M. Life of Abraham Lincoln. 1900. 2 vols.
TIFFANY, FRANCES. Life of Dorothea Lynde Dix. 1891.
WASHINGTON, B. T. Frederick Douglass. 1907.
WASHINGTON, B. T. Up from Slavery. 1901.
WEST, JENNIE J. CORNWALLIS-. The Reminiscences of Lady Randolph Churchill. 1908.
WHIPPLE, E. P. Recollections of Eminent Men. 1886.

[1] This volume contains accounts of noted artists and sculptors, prose writers, composers, poets, and inventors.

SECOND YEAR — FIRST SEMESTER

The World's Work — General

ALLERTON, S. W. Practical Farming. 1907.
CALKINS, E. E., and HOLDEN, RALPH. Modern Advertising. 1909.
CARNEGIE, ANDREW. The Empire of Business. 1902.
COLE, G. S. Art of Salesmanship. A manual for retail dry-goods salesmen. 1896.
COLLINS, J. H. Human Nature in selling Goods. *c.* 1909.
CORBION, W. A. The Principles of Salesmanship, Deportment, and System. A textbook for department-store service. 1907.
DAWSON, M. M. The Business of Life Insurance. 1906.
DE WEESE, T. A. The Principles of Practical Publicity. Second edition. 1908.
DICKSEE, L. R., and BLAIN, H. E. Office Organization and Management. 1906.
DRYDEN, J. F. Addresses and Papers on Life Insurance.[1] 1909.
FISKE, G. B. (comp.). Prize Gardening. 1901.
FITCH, SIR J. W. Lectures on Teaching. New edition. 1887.
GUERNSEY, A. H. The World's Opportunities, and how to use them. 1887.
HALL, BOLTON. A Little Land and a Living. 1908.
HASKINS, C. W. Business Education and Accountancy. 1904.
HASLUCK, P. N. (ed.). The Book of Photography. 1905.
HUBER, P. G., JR. The Stage as a Career. A sketch of the actor's life, its requirements, hardships, and rewards. 1900.
KLEISER, GRENVILLE. How to speak in Public. Seventh edition. 1910.
MATHEWS, J. McD. How to succeed in the Practice of Medicine. 1905.
MITCHELL, S. W. Doctor and Patient. 1904.
MORRIS, WILLIAM. The Decorative Arts. Their relation to modern life and progress.
MUNSON, J. E. The Art of Phonography. New revised edition. 1904.
PALMER, G. H., and ALICE F. The Teacher. 1908.
Some Arts and Crafts. 1903.[2]
STODDARD, J. S. What shall I do? Fifty profitable occupations for boys and girls who are undecided as to how to earn their own living.[3] *c.* 1899.

[1] See Chapter VII, "Life Insurance as a Career."

[2] Contents: Furniture and Decoration, by May Crommelin and Mrs. R. B. Shaw; Wood Carving, by Maria E. Reeks; The Art of Enameling, by Elinor Hallé; Spinning and Weaving, by A. M. C. Bagley; Bookbinding, by Ethel M. M. M'Kenna; Photographic Portraiture as a Profession, by Alice Hughes.

[3] An excellent little book with which to begin a study of this problem.

STRONG, C. J. The Art of Show-Card Writing. 1907.
THRASHER, M. B. Tuskegee, its Story and its Work. 1900.
WASHBURN, R. M. Principles and Practice of Ice-Cream Making. 1910.
WRIGHT, GRANT. The Art of Caricature. 1904.

The World's Work—For Men

ARNOLD, H. L. The Factory Manager and Accountant. 1910.
AYLMER-SMALL, SIDNEY. How to become a Successful Motorman. 1908.
BAILEY, L. H. The Training of Farmers. 1909.
BATES, W. W. American Navigation. 1902.
BAUER, A. G. The Art of Window Dressing for Grocers. *c.* 1902.
BEVERIDGE, A. J. The Young Man and the World. 1906.
BRITIGAN, W. H., and WHARTON, G. W. (ed.). Practical Real-Estate Methods. Third edition. 1910.
BYXBEE, O. F. Establishing a Newspaper. 1901.
CLARE, GEORGE. A B C of Foreign Exchanges. Fourth edition. 1905.
COCHRANE, C. H. Modern Industrial Progress. 1904.
COLE, W. M. Accounts, their Construction and Interpretation for Business Men and Students of Affairs. 1908.
COLLINS, J. H. The Art of Handling Men. *c.* 1910.
DEWSNUP, E. R. (ed.). Railway Organization and Working. 1906.
DUNCAN, R. K. The Chemistry of Commerce. 1907.
FISKE, A. K. The Modern Bank. 1904.
FOLTZ, E. B. K. The Federal Civil Service as a Career. 1909.
FOWLER, N. C. Building Business. 1893.
GIVEN, J. L. Making a Newspaper. 1907.
GLADDEN, WASHINGTON. The Church and Modern Life. 1908.
GRAYSON, DAVID. Adventures in Contentment. 1907.
GREEN, S. B. Principles of American Forestry. 1903.
HARCOURT, L. F. VERNON-. Civil Engineering as applied in Construction. Second edition, revised by Henry Fidler. 1910.
HOOPER, FREDERICK, and GRAHAM, JAMES. Home Trade; or, Modern Commercial Practice. Second edition. 1905.
HOYT, A. S. The Work of Preaching. 1909.
JOHNSON, CHARLES. Guide to Successful Auctioneering. *c.* 1903.
MCPHERSON, L. G. Working of the Railroads. 1907.
MOODY, W. D. Men who sell Things. Eighth edition. 1910.
NELSON, E. H. The Traveling Salesman. Fourth edition. *c.* 1891.
OLIN, C. H. Journalism. Explains the workings of a modern newspaper office, and gives full directions for those who desire to enter the field of journalism. 1906.

PARSONS, C. C. Business Administration. 1909.
PHILLIPS, W. B. How Department Stores are carried on. 1901.
PRATT, S. S. The Work of Wall Street. 1910.
RAINSFORD, W. S. A Preacher's Story of his Work. 1904.
REID, WHITELAW, and others. Careers for the Coming Men. 1907.
ROCHELEAU, W. F. The Geography of Commerce and Industry. *c.* 1905.
SCOTT, W. D. The Theory of Advertising. 1904.
SCOTT, W. D. Money and Banking. 1903.
SHUMAN, E. L. Practical Journalism. 1903.
SMITH, J. R. The Organization of Ocean Commerce. 1905.
STARBUCK, R. M. Standard Practical Plumbing. 1910.
STATHAM, H. H. Architecture for General Readers. 1896.
VEBLEN, T. B. The Theory of Business Enterprise. 1904.
WATERHOUSE, P. L. The Story of the Art of Building. 1901.
WILLIAMS, ARCHIBALD. How it is done; or, Victories of the Engineer. *c.* 1908.

The World's Work — For Women

ALDEN, CYNTHIA W. Women's Ways of earning Money. 1904.
BENNETT, ARNOLD. Journalism for Women. 1898.
BOSTWICK, A. E. The American Public Library. 1910.
CAMPBELL, HELEN S. Household Economics. 1897.
CAMPBELL, HELEN S. Women Wage Earners. 1893.
CANDEE, HELEN C. How Women may earn a Living.[1] 1900.
CHURCH, ELLA R. Money Making for Ladies. 1882.
CROLY, JANE CUNNINGHAM. (*Jenny June.*) Thrown on her own Resources; or, What Girls can do. *c.* 1891.
DANA, J. C. A Library Primer. Fifth and revised edition. 1910.
DRYSDALE, WILLIAM. Helps for Ambitious Girls. *c.* 1900.
HERSEY, HELOISE E. To Girls. 1902.
HODSON, JANE. How to become a Trained Nurse. 1898.
KILBOURN, KATHERINE R. Money-Making Occupations for Women. Second edition. 1901.
LAUGHLIN, CLARA E. (ed.). The Complete Dressmaker. 1907.
LYTTLETON, MRS. ARTHUR. Women and their Work. 1901.
MACLEAN, ANNIE M. Wage-Earning Women. 1910.
MALLON, ISABEL A. S. (*Ruth Ashmore.*) The Business Girl in Every Phase of her Life. 1898.

[1] A discussion of twenty lines of activity which are open to women, setting forth the necessary natural qualifications, the desirable preliminary training, and the remuneration which may be expected in each.

Needlework.[1] 1903.
RICHARDSON, DOROTHY. The Long Day. The story of a New York working girl. 1905.
SALMON, LUCY M. Domestic Service. 1897.
THOBURN, J. M. The Deaconess and her Vocation. 1893.
VAN VORST, BESSIE and MARIE. The Woman who toils. 1903.
WHITE, SALLIE J. Business Openings for Girls. *c.* 1891.
WOMEN'S EDUCATIONAL AND INDUSTRIAL UNION, Boston. *Department of Research.* Vocations for the Trained Woman. *c.* 1910.

SECOND YEAR — SECOND SEMESTER

Choosing a Vocation

BOLEN, G. L. Getting a Living. 1903.
DRYSDALE, WILLIAM. Helps for Ambitious Boys. *c.* 1899.
EGGLESTON, G. C. How to make a Living. Suggestions upon the art of making, saving, and using money. 1875.
FISKE, L. F. Choosing a Life Work. *c.* 1899.
HIGH SCHOOL TEACHERS' ASSOCIATION OF NEW YORK CITY. *Students' Aid Committee.* Choosing a Career. A circular of information for boys. *c.* 1909.
HIGH SCHOOL TEACHERS' ASSOCIATION OF NEW YORK CITY. *Students' Aid Committee.* Choosing a Career. A circular of information for girls. *c.* 1909.
MANSON, G. J. Ready for Business; or, choosing an Occupation. 1889.
MARDEN, O. S. Choosing a Career. *c.* 1905.
MARSLUND, FRANK. Occupations in Life. 1905.
PARSONS, FRANK. Choosing a Vocation. 1909.
ROLLINS, F. W. What can a Young Man do? 1909.
SHAW, ALBERT. The Outlook for the Average Man. 1907.
SIZER, NELSON. What to do and why. Trades and professions and the talents and temperaments required for each. 1872.
STRONG, JOSIAH. The Times and Young Men. *c.* 1901.
WINGATE, C. F. What shall our Boys do for a Living? 1908.
WYCKOFF, W. A. The Workers. An experiment in reality.[2] 1897–1898. 2 vols.

[1] Contents: Embroidery, by Ruth M. Day; Dressmaking, by J. E. Davis; Millinery, by Mrs. Turnbull; Knitting and Crocheting, by Mrs. Turnbull and Miss Turnbull.

[2] Contents: 1. The East; 2. The West. Story of a college man who tried to make a living at odd jobs.

THIRD YEAR — FIRST SEMESTER

Preparation for Life's Work

BARBE, WAITMAN. Going to College. *c.* 1899.

BURNHAM, W. P. Three Roads to a Commission in the United States Army. 1893.

CONWELL, R. H. The New Day; or, Fresh Opportunities.

CORBIN, JOHN. Which College for the Boy? 1908.

CRAWFORD, MARY C. The College Girl of America, and the Institutions which make her what she is. 1905.

EWART, J. A., and others. A Civil Service Manual. 1908. 3 vols.

FRANKLIN, W. S., and ESTY, WILLIAM. The Elements of Electrical Engineering. Sixth edition. 1910. 2 vols.

HALL, S. R. How to get a Position and how to keep it.[1] 1908.

HANCOCK, H. I. Life at West Point. 1902.

HYDE, W. D. The College Man and the College Woman. 1906.

LEUPP, F. E. How to prepare for a Civil Service Examination. *c.* 1898.

LOW, W. H. A Painter's Progress.[2] 1910.

MILLER, FRED. The Training of a Craftsman. 1898.

NORRIS, H. H. An Introduction to the Study of Electrical Engineering. Second edition, revised. 1909.

PLYMPTON, G. W. How to become an Engineer; or, the Theoretical and Practical Training necessary in fitting for the Duties of the Civil Engineer. 1908.

RALPH, JULIAN. Making of a Journalist. 1903.

REEVES, I. L. A Manual for Aspirants for Commissions in the United States Military Service. 1910.

SCHRIEVER, J. B. (ed.). Complete Self-instructing Library of Practical Photography. Popular edition. 1909. 10 vols.

SLOANE, T. O'C. How to become a Successful Electrician; containing the studies to be followed, methods of work, field of operation, professional ethics, and wise counsel. Fifteenth edition, revised and enlarged. 1906.

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[1] Gives information about advertising for a position and how to write letters of application.

[2] Contents: The awakening of vocation; the education of the artist; the problem of self-support; experiences in the Old World; thirty years at home and abroad; our present and our future.

[3] Contents: In general administration; in banking; in transportation; in insurance; in human relations.

THIRD YEAR — SECOND SEMESTER

Business Ethics

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FOURTH YEAR — FIRST SEMESTER

Social Ethics — The Individual and Society

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HUXLEY, T. H. Evolution and Ethics.[2] 1903.
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RIIS, J. A. The Battle with the Slum. 1902.
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[3] Letters of Samuel M. Jones, late Mayor of Toledo, Ohio, to the men who worked in his machine shops.

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NEW YORK CITY

The development of vocational guidance in New York City has been almost entirely within the schools. The High School Teachers' Association, through its Students' Aid Committee, first offered help to graduates in securing positions, and later extended the work to directing pupils in choosing a vocation earlier in the course. Each day and evening high school in 1908 had a teacher serving voluntarily in the capacity of vocational counselor. In order to reach more children than could be reached by personal conferences, the committee published leaflets on such subjects as "Choosing a Career," "Openings for Boys in Machine Shops," "Vocational Adjustment of Children to the Public Schools." These leaflets were practical and definite. They presented facts in such a way that the attention of children and parents was called to the value of making a choice of vocation and of some definite preparation therefor.

For instance, comparisons of the average earning capacity in several lines of work were made, and the differences represented by the cash sum which would be required to buy an equivalent annuity. The committee is making several systematic investigations which will furnish a more scientific basis for its future work.

CINCINNATI, OHIO

Cincinnati is working out a system of vocational guidance in which coöperation with the employers, physical and psychological examinations, and a carefully kept record are important features.

Reflection will show that a well-considered system of vocational guidance is especially necessary wherever the schools offer varied vocational courses. To leave the children without counsel in making a choice from among the many educational opportunities would be to invite defeat for the plan of diversified schools. The misfits might be quite as numerous and the ultimate educational results be even more disastrous than where all children are compelled to follow the one traditional, cultural, course of study. It is also clear that, under such circumstances, vocational guidance will fall under three rather distinct classifications: the giving of advice to pupils as to choice of schools and courses within the school system; the placement of pupils when they are ready to assume, or must perforce enter upon, the vocational responsibilities of life; and the giving of such subsequent assistance as the young worker may need in adjusting himself to his new and unfamiliar surroundings.

CHAPTER XVII

STATE LEGISLATION

Theoretically, at least, public opinion and interest are expressed in legislation. It is therefore pertinent to examine recent state legislation relating to industrial education.

No attempt is made to give an exhaustive recapitulation of such legislation, and much that is more or less closely related to our subject must be ignored. For example, the activity of the National Child Labor Committee has brought about, during the last five years, important modifications in laws affecting child labor and compulsory school attendance, and has secured a more rigid enforcement of laws already on the statute books; but while this has a definite and important bearing on industrial education, it cannot be considered here.

Similarly, since the legislation in certain of the Western states employs a phraseology which does not admit of a clear distinction between manual training and industrial education, it is omitted from this summary.

The examples of state legislation which we shall examine relate directly to industrial education given in the upper elementary grades and in the secondary schools of the existing public-school systems, or in specially organized schools for children above the compulsory age.

In 1909 the American Association for Labor Legislation published a summary of legislation on industrial education in public schools. This summary was prepared by Professor Edward C. Elliott, of the University of Wisconsin.

In *Bulletin No. 12*, issued by the National Society for the Promotion of Industrial Education in 1910, this summary was

revised, and critical comments on the extant legislation on the subject were added by Mr. Charles A. Prosser, Deputy Commissioner of Education for Massachusetts.

Vocational Education for September, 1911, gave a brief abstract of the most recent additions to state legislation in the interests of industrial education.

In making the following compilations from these sources and from the original texts, the author's purpose is to give some comprehension of the nature and extent of the influence which the people of the several states, acting through their legislatures, have brought to bear on the movement for industrial education.

It is important to note whether the legislation is permissive or mandatory; whether state aid is given, and under what conditions; and with whom the initiative for providing industrial education rests.

The states are considered alphabetically, and the chronology, so far as that is important, can be had by referring to the text. The laws of Massachusetts, New York, and Wisconsin are given in considerable detail because of their important differences and great suggestiveness.

Connecticut

The Connecticut scheme for public trade schools is unique in that such schools are completely and directly under the control of the state and may derive their entire support therefrom.

The Laws of 1909, Chapter 85, authorize and direct the State Board of Education to establish two schools. A maximum of fifty thousand dollars annually may be expended by said board for their buildings, equipment, and maintenance. The local communities have no share in the control, but may contribute any sum, properly voted, to the enlargement of the school or for the improvement of its efficiency.

Day, part-time, and evening classes are provided for, and the Board of Education is authorized to enter into coöperative arrangements with manufacturing and mechanical establishments. It is provided that no person under fourteen years of age shall be admitted, except that during vacations the board may admit such children.

Indiana

The new laws relating to industrial education in Indiana (Acts of 1911) are two in number. The first is a special bill, and makes it possible for Indianapolis to acquire the Winona Technical Institute. The second provides for a "commission for investigation of industrial and agricultural education," consisting of seven members to be appointed by the governor. The commission is to investigate the needs of education in the different industries of Indiana, and to see how far these needs are met by existing institutions. It is to consider what new forms of educational effort are advisable. It is to investigate also, by means of printed reports and the testimony of experts, what has been done in other states and in foreign countries in similar educational work. The committee is to hold hearings in at least five different communities, at which meetings the testimony of interested parties is to be taken. The report of the committee is to be sent to the legislature not later than January 1, 1913.

Kansas

Chapter 20 of the Laws of 1903 authorizes boards of education in cities of the first and second class to levy a special tax of one half mill (amended in 1909 to $\frac{1}{8}$ mill), and in other cities and districts one mill (amended in 1909 to $\frac{1}{4}$ mill), for the equipment and maintenance of industrial-training schools or industrial-training departments in the public schools. The statute provides for state aid equal to the amount contributed by the

school district for such purpose, but not to exceed the sum of two hundred fifty dollars. The total sum contributed by the state is not to exceed ten thousand dollars in any one year.

MAINE

The Laws of 1911, Chapter 188, provide that the state superintendent shall advise and aid in the introduction of industrial courses in free high schools and academies aided by the state. The act also provides for the introduction into all normal schools of courses in manual arts, domestic science, and agriculture sufficient to enable the graduates to teach elementary courses in rural and grade schools. In one normal school the courses are to be extended so as to prepare special teachers in manual training, and in another to prepare special teachers in domestic science. For these two special courses an annual expenditure of four thousand dollars is authorized in addition to other appropriations.

Whenever any elementary school provides instruction in manual training and domestic science that satisfies the requirement of the state superintendent, two thirds of the cost of said instruction shall be paid by the state, up to eight hundred dollars per instructor. Two thirds of the cost of instruction shall be paid by the state to any high school providing instruction in agriculture, mechanic arts, or domestic science, not to exceed five hundred dollars annually for each school. State aid is also given to evening schools which include in their course of study free-hand or mechanical drawing, domestic science or manual training, or the elements of the trades.

Any town may, by vote, require its school committee to establish and maintain as a part of the public-school system a general industrial school, open to all children who have completed the elementary course, or who have attained the age of fifteen years, for the teaching of agriculture, household science,

the mechanic arts, and the trades. Such schools must be supported by funds additional to the regular school fund; must be maintained for a period of thirty-six weeks during the school year; must employ at least one teacher for the exclusive work of the school; and must have an average attendance of at least twenty pupils. When these requirements are fulfilled the state will aid to the amount of two thirds of the cost of instruction, not to exceed two thousand dollars annually for any one town. The state provides for an annual appropriation of twenty-seven thousand five hundred dollars.

Massachusetts

Section 2, Chapter 42, Revised Laws of 1902, authorizes towns to maintain evening schools; course of study including industrial drawing, both free-hand and mechanical. The maintenance is mandatory for cities and towns of ten thousand or more population.

Sections 20–22, Revised Laws of 1902, as amended; Chapter 248, Acts of 1904, authorize the organization of corporations for the conduct of textile schools and provide for instruction in the theory and practical art of textile and kindred branches of the industry. The schools are to be supported by appropriations from city and state.

Chapter 94, Res. 1905. Establishes a commission to consider the needs for technical education in the different grades of industrial skill and responsibility.

Chapter 505, Acts of 1906, as amended by Chapter 572, Acts of 1908, as amended by Chapter 540, Acts of 1909, provides for the appointment and organization of the Commission on Industrial Education; defining duties, powers, and authority relative to the establishment and supervision of independent industrial schools throughout the state. The acts provide for state aid equal to one half of the local expenditure.

Chapter 64, Res. 1907, provides for inquiry into the organization and methods of the textile schools of the commonwealth by the Commission on Industrial Education.

Chapter 457, Acts of 1909, provides for the termination of the Commission on Industrial Education; for the transfer of its duties, powers, and authority to the reorganized Board of Education; and for the appointment of a commissioner of education, and two deputy commissioners, one of whom shall be especially qualified to deal with industrial education.

Chapter 133, Res. 1910, provides for an investigation and report relative to the establishment of a system of agricultural schools.

Chapter 471, Acts of 1911, codifies and amends the laws relating to state-aided vocational education, and specifically repeals all conflicting acts or parts of acts passed in previous years.

Chapter 471, Acts of 1911, begins by defining "vocational education," "industrial education," etc., as follows:

Section 1. The following words and phrases as used in this act shall, unless a different meaning is plainly required by the context, have the following meanings:

1. "Vocational education" shall mean any education the controlling purpose of which is to fit for profitable employment.

2. "Industrial education" shall mean that form of vocational education which fits for the trades, crafts, and manufacturing pursuits, including the occupations of girls and women, carried on in workshops.

3. "Agricultural education" shall mean that form of vocational education which fits for the occupations connected with the tillage of the soil, the care of domestic animals, forestry, and other wage-earning or productive work on the farm.

4. "Household-arts education" shall mean that form of vocational education which fits for occupations connected with the household.

5. "Independent industrial, agricultural, or household-arts school" shall mean an organization of courses, pupils, and teachers, under a distinctive management, approved by the Board of Education, designed to give either industrial, agricultural, or household-arts education as herein defined.

6. "Evening class" in an industrial, agricultural, or household-arts school shall mean a class giving such training as can be taken by persons already employed during the working day, and which, in order to be called vocational, must, in its instruction, deal with the subject matter of the day employment and be so carried on as to relate to the day employment.

7. "Part-time or continuation class" in an industrial, agricultural, or household-arts school shall mean a vocational class for persons giving a part of their working time to profitable employment, and receiving in the part-time school instruction complementary to the practical work carried on in such employment.

To give "a part of their working time" such persons must give a part of each day, week, or longer period to such part-time class during the period in which it is in session.

8. "Independent agricultural school" shall mean either an organization of courses, pupils, and teachers under a distinctive management designed to give agricultural education, as hereinafter provided for; or a separate agricultural department, offering in a high school, as elective work, training in the principles and practice of agriculture to an extent and of a character approved by the Board of Education as vocational.

9. "Independent household-arts school" shall mean a vocational school designed to develop on a vocational basis the capacity for household work, such as cooking, household service, and other occupations in the household.

STATE ADMINISTRATION AND SUPERVISION

Section 2. The Board of Education is hereby authorized and directed to investigate and to aid in the introduction of industrial, agricultural, and household-arts education; and to initiate and superintend the establishment and maintenance of schools of the aforesaid forms of education; and to supervise and approve such schools, as hereinafter provided. The Board of Education shall make a report annually to the general court, describing the condition and progress of industrial, agricultural, and household-arts education during the year, and making such recommendations as the board may deem advisable.

TYPES OF SCHOOLS

Section 3. In order that instruction in the principles and practice of the arts may go on together, independent industrial, agricultural, and household-arts schools may offer instruction in day, part-time, and evening classes. Attendance upon such day or part-time classes shall be restricted to those over fourteen and under twenty-five years of age; and upon such evening classes, to those over seventeen years of age.

LOCAL ADMINISTRATION AND CONTROL

Section 4. Any city or town may, through its school committee or through a board of trustees elected by the city or town to serve for a period of not more than five years, and to be known as the Local Board of Trustees for Vocational Education, establish and maintain independent industrial, agricultural, and household-arts schools.

Section 5. 1. Districts composed of cities or towns, or of cities and towns, may, through a board of trustees to be known as the District Board of Trustees for Vocational Education, establish and maintain independent industrial, agricultural, or household-arts schools. Such district board of trustees may consist of the chairman and two other members of the school committee of each of such cities and towns, to be appointed for the purpose by each of the respective school committees thereof; or any such city or town may elect three residents thereof to serve as its representatives on such district board of trustees.

2. Such a district board of trustees for vocational education may adopt for a period of one year or more a plan of organization, administration, and support for the said schools, and the plan, if approved by the Board of Education, shall constitute a binding contract between the cities and towns which are, through the action of their respective representatives on the district board of trustees, made parties thereto, and shall not be altered or annulled except by vote of two thirds of the board, and the consent of the Board of Education to such alteration or annulment.

Section 6. Local and district boards of trustees for vocational education, administering approved industrial, agricultural, or household-arts schools, shall, under a scheme to be approved by the Board of Education, appoint an advisory committee composed of members representing local trades, industries, and occupations. It shall be the duty of the advisory committee to counsel with and advise the local or district board of trustees and other school officials having the management and supervision of such schools.

Section 7 provides that residents of a district which does not provide a school of this type may request the Board of Education to admit them to the school of another city or town. The tuition is to be paid by the town where applicants reside, and said town is to be reimbursed in part by the state.

Section 9. 1. The commonwealth, in order to aid in the maintenance of approved local or district independent industrial or household-arts schools and of independent agricultural schools consisting of other than agricultural

departments in high schools, shall, as provided in this act, pay annually from the treasury to cities and towns maintaining such schools an amount equal to one half the sum, to be known as the net maintenance sum. Such net maintenance sum shall consist of the total sum raised by local taxation and expended for the maintenance of such a school, less the amount, for the same period, of tuition claims, paid or unpaid, and receipts from the work of the pupils or the sale of products.

2. Cities and towns maintaining approved local or district independent agricultural schools, consisting only of agricultural departments in high schools, shall be reimbursed by the commonwealth, as provided in this act, only to the extent of two thirds of the salary paid to the instructors in such agricultural departments; *provided* that the total amount of money expended by the commonwealth in the reimbursement of such cities and towns for the salaries of such instructors for any given year shall not exceed ten thousand dollars.

3. Cities and towns that have paid claims for tuition in approved local or district independent vocational schools shall be reimbursed by the commonwealth, as provided in this act, to the extent of one half the sums expended by such cities and towns in payment of such claims.

MICHIGAN

Act 35, Laws of 1907, as amended by Acts of 1909, establishes county schools of agriculture, manual training, and domestic economy. Instruction is to be given in the elements of agriculture, farm accounts, manual training, and domestic economy. It provides for general supervision by the state superintendent of public instruction, and for annual state aid equal to two thirds of the local expenditure. The maximum aid to be given to any one school is fixed at four thousand dollars.

Act 228, Laws of 1909, provides for a state commission on industrial education, including elementary training in agriculture.

Act 22, Laws of 1911, empowers school districts to establish and maintain trade, vocational, industrial, marine, and manual-training schools, gymnasiums, and scholarships, and to accept gifts, legacies, and devices for the same. This, however, was in

the nature of a local act, and was intended to give a certain city the right to accept a bequest which had been made to it.

Act 29, Laws of 1911, amends the law in regard to county schools of agriculture, the state superintendent being allowed to approve two such schools in each county instead of one.

NEW JERSEY

The Laws of 1903, Chapter 1, extend state aid to school districts establishing and supporting industrial education or manual training in the course of study of the schools of the district. The aid so given equals the local expenditure, and provides that minimum local expenditure shall be two hundred fifty dollars.

The Laws of 1907, Chapter 223, authorize expenditures for buildings for industrial education in cities of the second class.

The Laws of 1908, Chapter 55, establish and maintain summer courses of instruction in methods of teaching elementary agriculture, manual training, and home economics, and appropriate two thousand dollars annually therefor.

The Laws of 1908, Jt. Res. No. 9, authorize the appointment of a commission to inquire into the subject of industrial education. Res. No. 7 of the Laws of 1909 continued this commission.

The Laws of 1881, Chapter 164, as amended by the Laws of 1906, Chapter 20, as amended by the Laws of 1909, Chapter 78, provide for the establishment of schools for industrial education by boards of education. The state grants aid equal to the local expenditures, up to a maximum of ten thousand dollars.

The Laws of 1911 provide that a commissioner of education be appointed by the governor for a term of five years. He is to have four deputy commissioners, one of whom is to devote his time to the inspection of industrial education, including agriculture.

NEW YORK[1]

ARTICLE 22. GENERAL INDUSTRIAL SCHOOLS, TRADE SCHOOLS, AND SCHOOLS OF AGRICULTURE, MECHANIC ARTS, AND HOME-MAKING

Section 600. General industrial schools, trade schools, and schools of agriculture, mechanic arts, and home-making may be established in cities. The Board of Education of any city, and in a city not having a Board of Education the officer having the management and supervision of the public-school system, may establish, acquire, conduct, and maintain as a part of the public-school system of such city, the following:

1. General industrial schools open to pupils who have completed the elementary-school course, or who have attained the age of fourteen years, and:

2. Trade schools open to pupils who have attained the age of sixteen years and have completed either the elementary-school course or a course in the above-mentioned general industrial school, or who have met such other requirements as the local school authorities may have prescribed.

3. Schools of agriculture, mechanic arts, and home-making open to pupils who have completed the elementary-school course, or who have attained the age of fourteen, or who have met such other requirements as the local school authorities may have prescribed.

Section 601. Such schools may be established in union free-school districts. The Board of Education of any union free-school district shall also establish, acquire, and maintain such schools for like purposes, whenever such schools shall be authorized by a district meeting.

Section 602. Appointment of an advisory board.

1. The Board of Education in a city, and the officer having the management and supervision of the public-school system in a city not having a Board of Education, *shall appoint* an advisory board of five members, representing the local trades, industries, and occupations. . . . Any vacancy occurring on such board shall be filled by the appointing power named in this section, for the remainder of the unexpired term.

2. It shall be the duty of such advisory board to counsel with and advise the Board of Education, or the officer having the management and supervision of the public-school system in a city not having a Board of Education, in relation to the powers and duties vested in such board or officer by section 603 of this chapter.

Section 603. Authority of the Board of Education over such schools. The Board of Education in a city, and the officer having the management and supervision of a public-school system in a city not having a Board of

[1] Extract from Education Law, 1910.

Education, and the Board of Education in a union free-school district which authorizes the establishment of a general industrial school, a trade school, or a school of agriculture, mechanic arts, and home-making, is vested with the same power and authority over the management, supervision, and control of such school, and the teachers or instructors employed therein, as such board or officer now has over the schools and teachers under their charge. Such boards of education or such officer shall also have full power and authority:

1. To employ competent teachers or instructors.

2. To provide proper courses of study.

3. To purchase or acquire sites and grounds, and to purchase, acquire, lease, or construct, and to repair suitable shops or buildings, and to properly equip the same.

4. To purchase necessary machinery, tools, apparatus, and supplies.

Section 604. State aid for general industrial schools, trade schools, and schools of agriculture, mechanic arts, and home-making.

1. The commissioner of education in the annual apportionment of the state school moneys shall apportion therefrom to each city and union free-school district the sum of five hundred dollars for each independently organized general industrial school, trade school, or a school of agriculture, mechanic arts, and home-making, maintained therein for thirty-eight weeks during the school year, and employing one teacher whose work is devoted exclusively to such school, and having an enrollment of at least twenty-five pupils, and maintaining a course of study approved by him.

2. The commissioner of education shall also make an additional apportionment to each city and union free-school district of two hundred dollars for each additional teacher employed exclusively in such schools for thirty-eight weeks during the school year.

3. The commissioner of education may, in his discretion, apportion to a district or city maintaining such schools, or employing such teachers for a shorter time than thirty-eight weeks, an amount pro rata to the time such schools are maintained or such teachers are employed. *This section shall not be construed to entitle manual-training high schools, or other secondary schools maintaining manual-training departments*, to an apportionment of funds herein provided for.

Section 605. Application for such moneys. All moneys apportioned by the commissioner of education for general industrial or trade schools shall be used exclusively for the support and maintenance of such schools in the city or district to which such moneys are apportioned.

Section 606. Annual estimate by Board of Education, and appropriations by municipal and school districts.

1. The Board of Education of each city, or the officer having the man-gement and supervision of the public-school system in a city not having a Board of Education, shall file with the common council of such city a written itemized estimate of the expenditures necessary for the maintenance of its general industrial schools, trade schools, or schools of agriculture, me-hanic arts, and home-making, and the estimated amount which the city will eceive from the state school moneys applicable to the support of such chools. The common council shall give a public hearing to such persons s wish to be heard in reference thereto. The common council shall adopt uch estimate, and after deducting therefrom the amount of state moneys pplicable to the support of such schools, shall include the balance in the nnual tax budget of such city. Such amount shall be levied, assessed, and aised by tax, upon the real and personal property liable to taxation in the ity, at the time and in the manner that other taxes for school purposes re raised. The common council shall have power by a two-thirds vote to educe or reject any item included in such estimate.

2. The Board of Education in a union free-school district which main-ains a general industrial school, trade school, or a school of agriculture, mechanic arts, and home-making, shall include in its estimate of expenses, pursuant to the provisions of sections 323 and 327 of this chapter, the mount that will be required to maintain such schools, after applying toward he maintenance thereof the amount apportioned therefor by the commis-ioner of education. Such amount shall thereafter be levied, assessed, and aised by tax, upon the taxable property of the district at the time and in he manner that other taxes for school purposes are raised in such district.

Section 607. Courses in schools of agriculture for the training of eachers. The state schools of agriculture at St. Lawrence University, at Alfred University, and at Morrisville may give courses for the training of eachers in agriculture, mechanic arts, domestic science, or home-making, pproved by the commissioner of education. Such schools shall be entitled o an apportionment of money, as provided in section 604 of this chapter, or schools established in union free-school districts. Graduates from such pproved courses may receive licenses to teach agriculture, mechanic arts, nd home-making in the public schools of the state, subject to such rules nd regulations as the commissioner of education may prescribe.

Ohio

The Laws of 1909 amending older laws authorize any Board of Education to establish and maintain manual-training, domestic-science, and commercial departments; and agricultural, industrial,

vocational, and trade schools in connection with the public-school system. No state aid is provided.

The Laws of 1910 provide that in case the Board of Education of any school district establishes part-time day schools for the instruction of youths over fourteen years of age who are engaged in regular employment, such Board of Education is authorized to require all youths who have not satisfactorily completed the eighth grade of the elementary schools to continue their schooling until they are sixteen years of age; provided, however, that such youths, if they have been granted age and schooling certificates and are regularly employed, shall be required to attend school not to exceed eight hours a week between the hours of 8 A.M. and 5 P.M. during the school term. All youths between fourteen and sixteen years of age who are not employed shall be required to attend school the full time.

The Cahill Act of 1911 makes the teaching of agriculture mandatory in all of the common schools of the state excepting in the cities. A second bill requires that all teachers in these schools must, after September, 1912, take an examination in agriculture.

OKLAHOMA

The Laws of 1908, Chapter 3, S.B. 109, put in force section 7, Article 13, of the constitution, requiring the teaching of the elements of agriculture, horticulture, stock feeding, and domestic science in the common schools; create a commission for agricultural and industrial education; provide for the establishment of departments of agricultural instruction in the state normal schools, and for the chair of agriculture for schools in the agricultural and mechanical college; and provide for the establishment and maintenance of agricultural schools of secondary grade in each supreme-court judicial district, with branch agricultural experiment stations and short courses for farmers in connection therewith.

Oregon

Section 3442 of the code provides for the distribution of industrial training, when required, through four years in district and county high schools. The Laws of 1907, p. 169, authorize the establishment of a department of industrial training in union high schools.

Pennsylvania

Pennsylvania has enacted a new school code (Acts of 1911), several provisions of which have a bearing on vocational education. Article 4, on the duties and powers of boards of school directors, authorizes any board to establish, equip, furnish, and maintain the following additional schools or departments for the education and recreation of persons residing in said district, which said additional schools or departments, when established, shall be an integral part of the public-school district and shall be so administered: namely, high schools, manual-training schools, vocational schools, domestic-science schools, kindergartens, libraries, museums, reading rooms, gymnasiums, playgrounds, schools for blind, deaf, and mentally deficient, truant schools, parental schools, schools for adults, public lectures, together with such other schools or educational departments as they, in their wisdom, may see proper to establish.

Article 9 provides that the state Board of Education shall encourage and promote agricultural education, manual training, domestic science, and such other vocational and practical education as the needs of the commonwealth may require.

Article 10 directs the state superintendent of public instruction to appoint one expert assistant in agricultural education, one in industrial education, and one in drawing.

Article 16, in prescribing the course of study for elementary schools, provides that there shall be taught the common English branches, together with such other branches, including drawing,

physical training, elementary manual training, elementary domestic science, and elementary agriculture, as the board of school directors in any district may prescribe.

Wisconsin[1]

Section 926: 22, as amended by Chapter 401, Acts of 1909. Any city in the state of Wisconsin or any school district having within its limits a city desiring to establish, conduct, and maintain a school or schools for the purpose of giving practical instruction in the useful trades to young men having attained the age of fourteen years and young women having attained the age of fourteen years, as a part of the public-school system of such city, is empowered to do so by complying with the provisions of sections 926: 23 to 926: 30 inclusive, of the Statutes of 1898.

Section 926: 23. Such trade school or schools shall be under the supervision and control of the school boards of the respective cities or school districts in which they may be located.

Section 926: 24. The school board of every such city or school district is given full power and authority to establish, take over, and maintain a trade school or schools, equip the same with proper machinery and tools, employ a competent instructor or instructors, and give practical instruction in one or more of the common trades. Such a trade school shall not be maintained, however, unless there be an average enrollment of at least thirty scholars.

Section 926: 25. Whenever any school board shall have established or taken over an established trade school, such school board may prepare the course of study, employ instructors, purchase all machinery, tools, and supplies, purchase or lease suitable grounds or buildings for the use of such school, and exercise the same authority over such school which it now has over the schools under its charge.

Section 926: 26, as amended by Chapter 155, Acts of 1909. Whenever any school board shall have established or taken over an already established trade school or schools, it may appoint an advisory committee to be known as the committee on trade schools, consisting of five citizens not members of the school board, each of whom is experienced in one or more of the trades to be taught in the school or schools, to assist in the administration of the trade school or schools located in that city, which committee shall be appointed by the president of such school board with the approval of the majority of the board. Such committee shall have authority, subject to the

[1] Extracts from education and apprenticeship laws.

approval and ratifications of the school board, to prepare courses of study, employ or dismiss instructors, purchase machinery, tools, and supplies, and purchase or rent suitable grounds or buildings for the use of such trade schools.

Section 926:27. Students attending any such trade school may be required to pay for all material consumed by them in their work in such school at cost prices, or in lieu thereof the school board may establish a fixed sum to be paid by each student in each course, which sum shall be sufficient to cover as nearly as may be the cost of the material to be consumed in such course; any manufactured articles made in such school may be disposed of at the discretion of the school board, and the proceeds shall be paid into the trade-school fund.

Section 926:28. Whenever any such school board shall have decided to establish a trade school or schools, or to take over one already established under the provisions of this act, a tax not exceeding one half of one mill on the total assessed valuation of such city shall be levied, upon the requisition of the school board, as other school taxes are levied in such city; the fund derived from such taxation shall be known as the trade-school fund, shall be used in establishing and maintaining a trade school or trade schools in such city, shall not be diverted or used for any other purpose whatsoever, and may be disposed of and disbursed by the school board of such city in the same manner and pursuant to the same regulations governing the disposition and disbursement of regular school funds by such boards.

Section 926:29. Any school board desiring to avail itself of the provisions of this act may, before the trade-school fund herein provided for becomes available, establish, take over, equip, and maintain a trade school or schools out of the regular school funds which may be at the disposal of such school board; provided, however, that all moneys used for these purposes out of the regular school funds shall be refunded within three years from the trade-school fund.

Section 926:30. 1. When the school board of any city of the second, third, or fourth class, or the school board of any school district having within its limits such a city, shall determine to establish, take over, conduct, or maintain such trade school, it shall publish notice of its intention so to do, with a copy of the resolutions or order expressing such determination, once each week for four successive weeks in a newspaper published in said school district, and shall take no further steps in said matter until the expiration of thirty days from the date of the first publication.

2. If within such thirty days there shall be filed with the clerk of such city a petition signed by a number of electors of the school district equal to twenty per centum of the number of votes cast in the said city at the last municipal election, praying that the question of the establishment, taking

over, conduct, and maintenance of such trade school shall be submitted to the vote of the electors of such school district, the city clerk shall at the earliest opportunity lay such petition before the common council. The common council shall thereupon at its next regular meeting, by resolution or ordinance, direct the city clerk to call a special election for the purpose of submitting such question to the electors of such city and school district.

5. If a majority of the ballots cast in such school district shall be in favor of the establishment, taking over, conducting, or maintenance of such trade school, then such board shall proceed, as heretofore provided, to establish, take over, conduct, and maintain such trade school. But if a majority shall vote against such proposition to establish, take over, conduct, and maintain a trade school, the board shall take no further steps toward such end.

6. If no petition to submit such proposition to establish, take over, or maintain a trade school to the vote of the electors shall be filed with the city clerk within thirty days after the first publication of the notice of the determination of the school board to take such action, then such school board may proceed as hereinbefore provided, without submitting such proposition to the electors of the district.

Acts of 1911, Chapter 347. Employment of Children — Apprenticeship

Section 1. Sections 2377 and 2394, inclusive, of the statutes are repealed.

Section 2. There are added to the statutes eleven new sections to read:

Section 2377. Every contract or agreement entered into between a minor and employer, by which the minor is to learn a trade, shall be known as an indenture, and shall comply with the provisions of sections 2378 to 2386, inclusive, of the statutes. Every minor entering into such a contract shall be known as an apprentice.

Section 2378. Any minor may, by the execution of an indenture, bind himself as hereinafter provided, and such indenture may provide that the length of the term of the apprentice shall depend upon the degree of efficiency reached in the work assigned, but no indenture shall be made for less than one year, and if the minor is less than eighteen years of age, the indenture shall in no case be for a period of less than two years.

Section 2379. Any person or persons apprenticing a minor or forming any contractual relation in the nature of an apprenticeship, without complying with the provisions of sections 2377 to 2387, inclusive, of the statutes, shall upon conviction thereof be punished by a fine of not less than fifty nor more than one hundred dollars.

Section 2380. It shall be the duty of the commissioner of labor, the factory inspector, or assistant factory inspectors to enforce the provisions of this act, and to prosecute violations of the same before any court of competent jurisdiction in this state.

Section 2381. Every indenture shall be signed:

1. By the minor.

2. By the father; and if the father be dead or legally incapable of giving consent or has abandoned his family, then

3. By the mother; and if both father and mother be dead or legally incapable of giving consent, then

4. By the guardian of the minor, if any.

5. If there be no parent or guardian with authority to sign, then by two justices of the peace of the county of residence of the minor.

6. By the employer.

Section 2382. Every indenture shall contain:

1. The names of the parties.

2. The date of birth of the minor.

3. A statement of the trade the minor is to be taught, and the time at which the apprenticeship shall begin and end.

4. An agreement stating the number of hours to be spent in work, and the number of hours to be spent in instruction. The total of such number of hours shall not exceed fifty-five in any one week.

5. An agreement that the whole trade, as carried on by the employer, shall be taught, and an agreement as to the time to be spent at each process or machine.

6. An agreement between the employer and the apprentice that not less than five hours per week of the afore-mentioned fifty-five hours per week shall be devoted to instruction. Such instruction shall include:

(*a*) Two hours a week instruction in English, in citizenship, business practice, physiology, hygiene, and the use of safety devices.

(*b*) Such other branches as may be approved by the State Board of Industrial Education.

7. A statement of the compensation to be paid the apprentice.

Section 2383. The instruction specified in section 2382 may be given in a public school, or in such other manner as may be approved by the Local Board of Industrial Education, and if there be no local board, subject to the approval of the State Board of Industrial Education. Attendance at the public school, if any, shall be certified to by the teachers in charge of the courses, and failure to attend shall subject the apprentice to the penalty of the loss of compensation for three hours for every hour such apprentice shall be absent without good cause. It shall be the duty of the school officials to coöperate for *the enforcement* of this law.

Section 2384. It shall be lawful to include in the indenture or agreement an article stipulating that during such period of the year as the public school shall not be in session the employer and the apprentice may be released from those portions of the indenture which affect the instruction to be given.

Section 2385. If either party to an indenture shall fail to perform any of the stipulations, he shall forfeit not less than ten nor more than fifty dollars, on complaint, the collection of which may be made by the commissioner of labor, factory inspector, or assistant factory inspectors in any court of competent jurisdiction in this state. Any court of competent jurisdiction may in its discretion also annul the indenture. Nothing herein prescribed shall deprive the employer of the right to dismiss any apprentice who has willfully violated the rules and regulations applying to all workmen.

Section 2386. The employer shall give a bonus of not less than fifty dollars to the apprentice on the expiration of the term of the indenture, and also a certificate stating the term of the indenture.

Section 2387. A certified copy of every indenture by which any minor may be apprenticed shall be filed by the employer with the state commissioner of labor.

Section 3. This act shall take effect and be in force from and after its passage and publication.

Approved June 15, 1911.

CHAPTER 505. EMPLOYMENT OF CHILDREN — SCHOOLS

Section 1. There is added to the statutes a new section, to read:

Section 1728c: 1. 1. Whenever any evening school, continuation classes, industrial school, commercial school, shall be established in any town, village, or city in this state for minors between the ages of fourteen and sixteen, every employer shall allow all minor employees over fourteen and under sixteen years of age a reduction in hours of work of not less than the number of hours the minor may by law be required to attend school.

2. The total number of hours spent by such minors at work and in the before-mentioned schools shall together not exceed the total number of hours of work for which minors over fourteen and under sixteen years of age may by law be employed, except when the minor shall attend school a greater number of hours than is required by law, in which case the total number of hours may be increased by the excess of the hours of school attendance over the minimum prescribed by law.

3. Employers shall allow the reduction in hours of work at the time when the classes which the minor is by law required to attend are held, whenever the working time and the class time coincide.

4. Any violation of this section shall be punished, as is provided in the case of violation of section 1728a of the statutes.

Section 2. All acts and parts of acts conflicting with any provisions of this act are repealed in so far as they are inconsistent therewith.

Section 3. This act shall take effect and be in force from and after its passage and publication.

Approved June 30, 1911.

Chapter 544. Industrial Education — Salaries of Teachers

Section 1. There is added to the statutes a new section, to read:

Section 553l: 1. No state aid shall be granted to any school for instruction given in agriculture, domestic economy, manual-training, or industrial branches unless the salary paid to every teacher instructing in such subjects be at least at the rate of sixty dollars per month.

Chapter 616. Industrial Education — Duties and Powers of State and Local Boards

Section 1. There are added to the statutes thirteen new sections, to read:

Section 553p: 1. 1. There is hereby created a State Board of Industrial Education to be appointed by the governor. The board shall consist of six appointive members, three of whom shall be employers of labor and three of whom shall be skilled employees. The state superintendent of education and the dean of the extension department and the dean of the college of engineering of the University of Wisconsin shall be ex officio members of this board.

2. Each appointive member shall hold office for two years and shall receive traveling expenses and one hundred dollars per year. In the first appointments the governor shall designate three members to serve for one year and three members to serve for two years from the first day of July of the year in which the appointments are made. All appointments thereafter shall be for two years except appointments to fill vacancies, which shall be for the unexpired portion of the term.

3. Said board (*a*) shall have control over all state aid given under this act; (*b*) shall meet quarterly and at such other times as may be found necessary; (*c*) shall report biennially.

Section 553p: 2. 1. The state superintendent of education shall appoint an assistant in the department of public instruction, to be known as the assistant for industrial education. He shall, with the advice, consent, and direction of the state superintendent of education, have general supervision over the public industrial schools and over all public evening schools, continuation schools, and commercial schools created under this act. The laws

relating to agricultural schools and the Platteville Mining Trade School shall remain unaffected by this act.

2. The salary of the assistant shall be fixed by the state superintendent of education with the approval of the State Board of Industrial Education.

3. The state superintendent of education shall have, in addition to the assistant for industrial education, such other assistants as he shall deem necessary for work in the same general field.

4. All positions except that of assistant for industrial education shall be filled by civil service examination, as provided by Chapter 363 of the Laws of 1905. But the total salary list, exclusive of the salary of the assistant, shall not exceed ten thousand dollars for any one year.

5. The assistant shall have all necessary expenses to attend conventions and make investigations within or outside of the state when such expenses shall have been previously authorized by the state superintendent of education.

Section 553p: 3. 1. In every town or village or city of over five thousand inhabitants there shall be, and in the towns, cities, and villages of less than five thousand inhabitants there may be, a local board of industrial education, whose duty it shall be to foster and establish and maintain industrial, commercial, continuation, and evening schools. Said board may take over and maintain in the manner provided in this act any existing schools of similar nature.

2. Such board shall consist of the city superintendent of schools ex officio, or the principal of the high school ex officio, if there be no city superintendent, or the president or chairman of the local board charged with the supervision of the schools in case there be neither of the above-mentioned officers, and four other members, two employers and two employees, who shall be appointed by the local board charged with the supervision of the schools, and who shall serve without pay.

3. The term of the appointive members of the local boards of industrial education shall be two years from the first of January of the year in which they are appointed.

4. The local board of industrial education shall elect its officers from its membership — a chairman and a secretary. The local boards of industrial education, with the coöperation of the State Board of Industrial Education, shall have general supervision of the instruction in the local schools created under this act.

5. No state aid shall be granted to schools created under this act without the approval of the local board of industrial education. No money appropriated by the city, town, or village for these schools shall be spent without the approval of the local board of industrial education.

6. The teachers in the schools created under this act shall be employed and their qualifications determined by the local board of industrial education.

7. This board shall have power to purchase all machinery, tools, and supplies, and purchase or lease suitable grounds or buildings for the use of the schools under its supervision. Existing school buildings and equipment shall be used as far as practicable.

8. The board is empowered to make contracts with the extension division of the University of Wisconsin to give instruction in such branches as the department may offer when, in the judgment of the local board, such instruction can be secured to better advantage than by local provision.

9. Whenever twenty-five persons qualified to attend an industrial, commercial, continuation, or evening school file a petition therefor with the local board of industrial education, the board shall establish such school or schools or provide other facilities as authorized in this act.

Section 553p: 4. 1. The local board of industrial education of every city, village, or town shall report to the common council, or village or town clerk, at or before the first day of September, in each year, the amount of money required for the next fiscal year for the support of all the schools established or to be established under this act in said city, village, or town, and for the purchase of necessary additions to school sites, fixtures, and supplies.

2. There shall be levied and collected in every city, village, or town, subject to taxation under this act, a tax upon all taxable property in said city, village, or town, at the same time and in the same manner as other taxes are levied and collected by law, which, together with the other funds provided by law and placed at the disposal of said city, village, or town for the same purpose, shall be equal to the amount of money so required by said local board of industrial education for the purposes of this act.

3. The rate of tax levied for the purposes of this act in any town, village, or city shall not in any one year exceed one half mill for the maintenance of all schools created under this act.

4. The said taxes for the purpose named in this section shall be in addition to all other general and special taxes levied for town, village, or city purposes, and shall be for the use and support of schools established under this act.

5. The treasurer of the town, village, or city shall keep such money separate from all other money, to be used exclusively for the purpose of industrial education as herein provided. All moneys appropriated and expended under this act shall be expended by the local board of industrial education and shall be paid by the town, village, or city treasurer on orders issued by said board and signed by its president and secretary.

6. All moneys received by said board shall be paid to the town, village, or city treasurer for the fund of the local board of industrial education.

Section 553p: 5. 1. The course of study in these schools shall be approved by the state superintendent of education and the State Board of Industrial Education, and shall include English, citizenship, sanitation, and hygiene, and the use of safety devices and such other branches as the state superintendent and the State Board of Industrial Education shall approve.

2. The local board of industrial education may allow pupils attending any school established under this act, who have had courses equivalent to any of those offered, to substitute other work therefor.

Section 553p: 6. 1. Not more than ten thousand dollars shall be appropriated from the state funds for the purposes of this act in any one city, town, or village, and state aid shall not be given to more than thirty schools established under this act.

2. A school once granted state aid shall be entitled thereto as long as the character of its work meets with the approval of the state superintendent of education and the State Board of Industrial Education.

3. The secretary of the local board of industrial education of each city, town, or village in which such school or schools are maintained shall, on the first day of July in each year, report to the state superintendent of education the cost of maintaining the school, the character of the work done, the number, names, and qualifications of the teachers employed, and such other information as may be required by the state superintendent of education.

4. If such report is satisfactory to the state superintendent of education and the State Board of Industrial Education, and they are satisfied that the school or schools have been maintained in a satisfactory manner for not less than eight months during the year ending the thirtieth of the preceding June, the state superintendent of education shall make a certificate to that effect and file it with the secretary of state. The secretary of state shall then draw a warrant payable to the treasurer of such city, town, or village in which the industrial school is located for a sum equal to one half the amount actually expended in such industrial school, continuation school, evening school, or commercial school during the preceding year, but not more than three thousand dollars shall be appropriated to any one school in one year.

Section 553p: 7. 1. The schools established under this act shall be opened to all residents of the cities, towns, and villages in which such schools are located, of fourteen years of age or over, who are not by law required to attend other schools. Any person over the age of fourteen who shall reside in any town, village, or city not having an industrial school as

provided in this act, and who is otherwise qualified to pursue the course of study, may with the approval of the local board of industrial education in any town, village, or city having a school established under this act, be allowed to attend any school under their supervision. Such persons shall be subject to the same rules and regulations as pupils of the school who are residents of the town, village, or city in which the school is located.

Section 553p: 8. 1. The local board of education is authorized to charge tuition fee for the nonresident pupils not to exceed fifty cents per week. On or before the first day of July in each year the secretary of the local board of industrial education shall send a sworn statement to the clerk of the city, village, or town from which any such person or persons may have been admitted. This statement shall set forth the residence, name, age, and date of entrance to such school, and the number of weeks' attendance during the preceding year of each such person at the school. It shall show the amount of tuition which, under the provisions of this act, the town, village, or city is entitled to receive on account of each and all such pupils' attendance. This statement shall be filed as a claim against the town, village, or city where the pupil resides and allowed as other claims are allowed.

Section 553p: 9. Students attending any school under this act may be required to pay for all material consumed by them in their work in such school at cost prices, or in lieu thereof the school board may establish a fixed sum to be paid by each student in each course, which sum shall be sufficient to cover, as nearly as may be, the cost of the material to be consumed in such course; any manufactured articles made in such school, and that may accumulate, shall be disposed of at their market value at the discretion of the school board, and the proceeds shall be paid to the local treasurer for the fund of the local board of industrial education.

Section 553p: 10. The State Board of Industrial Education shall also constitute a body corporate under the name of the "Board of Trustees of the Stout Institute," and shall possess all powers necessary or convenient to accomplish the objects and perform the duties prescribed by law. In such capacity such board shall also employ such clerks and assistants as may be necessary to properly conduct its affairs. The state treasurer shall be ex officio treasurer of the board, but the board may appoint a suitable person to receive fees or other moneys that may be due such board, to disburse any part thereof, to account therefor, and to pay the balance to the state treasurer.

Section 553p: 11. Such board is authorized to accept, free of cost to the state, and to hold as a trustee for the state, the property of the Stout Institute located at Menominee, Wisconsin, and to maintain such institute under the name of "The Stout Institute"; provided that the trustees of said

Stout Institute turn over to the state, within two months after the passage and publication of this act, said property free and clear of all encumbrances and debt, released from all claims or interest which the city of Menominee or the heirs of James H. Stout may have had in said property, and having put the buildings in good condition and having made such repairs as may be necessary before turning over said property. The board is also authorized to accept such other property or moneys as it may deem advisable to be accepted, which can profitably be used by it in promoting the interests intrusted to it. Such boards may purchase, have, hold, control, possess, and enjoy in trust for the state, for educational purposes, any lands, tenements, hereditaments, goods and chattels, of any nature, which may be necessary and required to accomplish the purpose and objects of the board, and may sell or dispose of any personal property when in its judgment it shall be for the interests of the state.

Section 553p: 12. The purposes and objects of the institute shall be to instruct young persons in industrial arts and occupations, and the theory and art of teaching such, and to give such instruction as will lead to a fair knowledge of the liberal arts, a just and seemly appreciation of the nobility and dignity of labor, and in general to promote diligence, economy, efficiency, honor, and good citizenship.

Section 553p: 13. The said board shall have power:

1. To make rules, regulations, and by-laws for the government and management of the institute and the students therein, including the power to suspend or expel students for misconduct or other cause.

2. To appoint a president of the institute and other officers, teachers, and assistants, and to employ such other persons as may be required; to fix the salary of each person so appointed or employed, and to prescribe their several duties; to remove at pleasure any president, other officer, teacher, assistant, or person from any office or employment in connection with the institute.

3. To purchase such supplies as may be necessary in the conduct of the institute and its various departments.

4. To prescribe rules, regulations, and terms for the admission and control of the students, to prescribe courses of study and methods and means of instruction, and to issue certificates or diplomas.

5. To coöperate with other educational institutions and agencies in instruction and training leading to efficiency in industrial arts and occupations.

Section 2. There is hereby appropriated out of any money in the state treasury not otherwise appropriated, a sum sufficient to carry into effect the provisions of this act. However, in no case shall the sum appropriated for the purpose of carrying out the provisions of this act exceed the sum of

thirty thousand dollars during the fiscal year ending July 1, 1912, nor more than fifty-five thousand dollars per annum thereafter. Twenty thousand dollars of the above moneys shall be set aside annually, beginning July 1, 1911, for the purpose of maintaining the Stout Institute as provided in this act.

Section 3. All acts and parts of acts conflicting with any provisions of this act are repealed in so far as they are inconsistent therewith; provided, however, nothing in this act shall be construed to interfere in any manner with trade schools established under Chapter 122, Laws of 1907 (sections 926:22 to 926:30 of the Annotated Statutes), and amendments thereof, unless the school board of any such city or school district shall by a majority vote adopt the provisions of this act, and shall proceed in the manner provided for, for every town, village, or city of over five thousand inhabitants as provided in this act.

Section 4. This act shall take effect and be in force from and after its passage and publication.

Approved July 7, 1911.

Chapter 660. Industrial Education — Attendance of Minors at School required

Section 1. Subsection 1 of section 1728c:1 of the statutes is amended, to read:

Section 1728c:1. Whenever any evening school, continuation classes, industrial school, or commercial school shall be established in any town, village, or city in this state for minors between the ages of fourteen and sixteen, working under permit as now provided by law, every such child residing within any town, village, or city in which any such school is established, shall attend such school not less than five hours per week for six months in each year, until such child becomes sixteen years of age; and every employer shall allow all minor employees over fourteen and under sixteen years of age a reduction in hours of work of not less than the number of hours the minor . . . is by this section required to attend school.

Section 2. This act shall take effect and be in force from and after its passage and publication.

Approved July 14, 1911.

The Wisconsin laws are more complete than those of any other state, since they correlate the regulations pertaining to school attendance, child labor, apprenticeship, and education.

Combined Agriculture, Manual Arts, and Home Economics

As indicative of the practice of combining agriculture, manual training, and home economics in the legislative enactments in agricultural states, and also as showing the growing interest in a practical education, the following legislation is noted.

MINNESOTA

Chapter 314, Laws of 1905, establishes and provides for the organization and maintenance of county schools of agriculture and domestic science, creates county school boards of control, and provides state aid to not more than two schools. Instruction is to be given in agriculture, farm accounts, manual training, and domestic economy.

Chapter 247, Laws of 1909, provides for the establishment and maintenance of departments of agriculture, manual training, and domestic economy in state high, graded, and consolidated schools, and authorizes rural schools to become associated with such state graded or high schools. It extends state aid equal to twice the amount of local expenditure and fixes the maximum annual aid to any one school at $2500, and the maximum number of schools to be aided at ten. It appropriates $25,000 for 1910 and $25,000 for 1911.

The Laws of 1911 reënact, by the Putnam Act, the legislation of 1909 with but minor modifications. The new features are:

First. An increase from ten to thirty of the number of schools to be designated to undertake the industrial work, thus adding twenty schools. (These were designated by the High School Board, April 22.)

Second. A provision for additional aid of $200 for each rural school district associating, $150 being paid to the central school and $50 to the rural school.

Third. Permitting tuition, not to exceed $2.50 a month per pupil, to be charged nonresident students taking the industrial work, the tuition to be paid by the school district in which the pupil resides.

Fourth. Permitting the rural schools associating to levy a tax for an industrial building in connection with the central school. This is merely a permissive provision; the matter is to be determined by each rural school district associating.

Fifth. Raising the minimum tax levy to be imposed on the associated schools to two mills, and removing the maximum limitation of four mills in the old law.

Sixth. Permitting a tract of land for experimental purposes to be acquired in one or more of the associated rural districts.

A part of section 3 reads: "The instruction in such agricultural and industrial department shall be of a practical character, dealing with soils, crops, fertilizers, drainage, farm machinery, farm buildings, breeds of live stock, live-stock judging, animal diseases and remedies, production of milk and cream, testing of same, manufacture of butter and cheese, horticulture, gardening, plants, and such other questions as have a direct relation to the business of farming, including bookkeeping and farm accounts. It shall also include systematic courses in manual training, and in home economics, as these are usually taught in public schools."

Chapter 91, a companion act to the Putnam Act, provides for establishing a course in agriculture and in either home economics or manual training in any high or graded school. One thousand dollars special aid is provided for each school. The High School Board is directed to designate the high or graded schools in which this work may be undertaken. An appropriation of $50,000 for the next school year, and $75,000 for the second year, is made. It will be understood that rural schools may associate to receive the benefits of industrial training under

this act in the same manner as under the Putnam Act. The additional aid of $200 for association does not extend to the schools maintaining industrial departments under this chapter [91]. Rural schools associated under either act, however, may receive the special state aid of $150, $100, or $75 provided for common schools under Chapter 60.

Chapter 207, an act relating to the consolidation of rural schools, and known as the Holmberg Act, provides that each consolidated school must be in session for eight months and must employ a principal who has special training and preparation for directing the teaching of agriculture and other industrial lines. A school of Class A must provide a building of four rooms or departments, and will receive state aid of $1500. A school of Class B must provide a building of three rooms and will receive state aid of $1000. One of Class C must be a two-department school and will receive $750 aid. Additional aid for the erection of a school building for either class, to the amount of 25 per cent of the cost and not exceeding $1500, is also provided.

NORTH DAKOTA

The legislature of 1911 passed a law providing state aid for rural and graded schools. The graded schools are divided into two classes, both of which must include in their courses of study two-year high-school courses as suggested by the State High School Board, such courses, for example, as domestic science, manual training, and elementary agriculture, and must comply with such rules as may be established by the state superintendent of public instruction.

The rural schools are divided into two classes, both of which must include in their course of study elementary agriculture. To these four classes of schools are given annually by the state $150, $100, $100, and $50 respectively, upon compliance with

certain conditions, including those stated above. Further state aid is offered as a premium for consolidation.

The new law, which went into effect July 1, 1911, provides for the maintenance of agricultural, manual-training, and domestic-economy departments in high schools. Any state high, graded, or consolidated rural school having satisfactory rooms and equipment, and having shown itself fitted by location and otherwise to do agricultural work, may, upon application to the High School Board, be designated to maintain an agricultural department.

Each of such schools shall employ trained instructors in agriculture, manual training, and domestic science (including cooking and sewing), and shall have connected therewith, so long as they shall enjoy the benefits of this act, a tract of land suitable for a school garden and purposes of demonstration, containing not less than ten acres and located within one mile of the school buildings.

Instruction in the industrial department herein provided shall be free to all residents of this state. Where necessary to accommodate a reasonable number of boys and girls able to attend only in the winter months, special classes shall be formed for them. Said department shall offer instruction in soils, crops, fertilizers, drainage, farm machinery, farm buildings, breeds of live stock, stock judging, animal diseases and remedies, production, testing, and hauling of milk and cream, the manufacture of butter and cheese, the growth of fruit and berries, management of orchards, market-garden and vegetable crops, cereal grains, fine seeds, bookkeeping and farm accounts, and all other matters pertaining to general practice.

Each of said schools shall receive state aid to the sum of $2500, and its proportionate share of all moneys appropriated by the national government for the teaching of elementary or secondary agriculture in the public or high schools of this state,

but shall not participate in the state aid now being given to the state high schools. Not more than five schools shall be aided the first year, nor more than five be added to the list every two years thereafter; provided that not more than one school in any county shall be added to the list of state schools receiving state aid under this act in any two years.

For the purpose of extending the teaching of agriculture, home economics, and manual training to pupils in rural schools, and for the purpose of extending the influence and supervision of state high or graded schools, one or more rural schools may become associated with any state high or graded school maintaining a department of agriculture, whether or not such high or graded school has been designated by the State Agricultural High School Board to receive aid under the provisions of this act.

VERMONT

By an act approved in January, 1909, any high or grammar school whose course of study or outline of work in manual training has been approved by the state superintendent of education, may, upon application, be placed upon an approved list of schools maintaining manual-training departments. A school once entered upon such list may remain there and be entitled to state aid so long as the scope and character of its work are maintained in such a manner as to meet the approval of such superintendent.

Two or more towns may unite as a district for the maintenance of the *industrial schools* provided for in the preceding section, but no such district should be created without the approval of the superintendent of education.

Approved January 27, 1909.

CHAPTER XVIII

CONCERNING AGRICULTURAL EDUCATION

While agricultural education does not come properly within our subject, since it is coördinate with, rather than a phase of, industrial education, it should be noted that there is a strong demand for this form of training throughout the country. Perhaps the most significant statement that can be made about it is that here, too, the demand is for a training which will reach the elementary grades through the training of teachers for rural schools, and for the establishment of thoroughly practical courses of agriculture, instead of courses in "high-school botany," for the secondary schools. Where such courses have been introduced, theory has not been omitted or minimized but has been immediately related to farm practices, and both experimentation and demonstration have been deemed fundamentally important.

While educators have been quicker to see the need of agricultural education than they have been to appreciate the needs of the industrial workers, and while they have brought the higher institutions for agricultural education nearer and nearer to the people, it remains for the practical men of affairs to see and to state the problem most clearly and to demand a thorough revision of our educational ideals and practices in rural communities.

One of the most searching and constructive discussions of this problem which has yet appeared is here given, partly for its intrinsic value and partly as corroborative of the main thesis of this volume, that specialized education will increase rather than diminish general education, and will thus insure a wider distribution of general intelligence.

Education for the Iowa Farm Boy[1]

By H. C. Wallace

Associate Editor of *Wallace's Farmer*

In recent years the higher prices of agricultural products and the consequent higher cost of living have turned the attention of the nation, and especially of the residents of cities, sharply toward the need for better farming and bigger crops. There has been widespread complaining against the farmer. He has for generations been making a bare living for his family. He has sold the fruits of his labor, not for what he might determine to be a fair price after making due allowance for the money invested and the labor expended, but for what the buyer has been willing to pay. If the average farmer has made money, it has been by the work of his children, by saving,— through the practice of the strictest economy, — and by the increase in the value of his land through the growth in population. If the average farmer should deduct from his gross earnings a fair interest on the money invested in land and equipment, make a reasonable allowance for depreciation of equipment, and pay a fair price for all the labor used aside from his own, he would have for his own labor, during a ten-year period, less than the wages of the clerk, the stenographer, or the freight brakeman. Without analyzing this condition, the bright farm boy has recognized its existence; hence the drift from the farm to town, and to new sections where cheap land can be had, thus duplicating for him the opportunities of his father.

With the coming of the higher prices for agricultural products came, as I have said, widespread complaint against the farmer. From the humble toiler, thankfully receiving whatever the buyer saw fit to give him, and with his much-talked-of independence as his chief asset, he became, almost overnight, the strong merchant, asking and receiving a fair price for his products, and

[1] A paper read before the Prairie Club of Des Moines on December 17, 1910.

finally reached the point where he was not compelled to haul his crops direct from the fields to the market to pay accumulated debts. The buyer resented this change. He had so long looked upon the farmer as a poorly paid laborer, thankful for the opportunity to serve, that his changed condition seemed the basest ingratitude. And so from all sorts and conditions of men came suggestions of ways to enable the farmer to produce larger crops, in order that they might be sold cheaper. The need for agricultural education has become generally recognized. Every city consumer will agree that the farmer must be educated, not so much because he wants to help the farmer, but in the hope that educated farmers may mean cheaper farm products. Men in all walks of life have been active in this propaganda for agricultural education. Railroads have run special trains, carrying instruction in farming, and have invited the farmers to come and hear. Railroad presidents have made speeches in public and have printed pamphlets for the farmer to read. Bankers have subscribed for cheap agricultural papers by the hundred and distributed them free, instead of calendars and chromos. Merchants have offered prizes for the biggest pumpkins and the largest ears of corn. State fairs have offered free scholarships at the agricultural colleges. A great western university has established an agricultural guild and arranged with the owners of country estates to permit city youths to work on them, so that if worst comes to worst the production on the farm may continue. Magazine writers have told of the romance of farming, of the success of bonanza farmers; and the magazines are full of pictures of the farmer in his automobile, driving from one field to another, inspecting his crops. The governor and industrial agent of a great state have started a back-to-the-farm movement, and propose to locate city laboring men on twenty-acre plots. City schoolteachers are taking homesteads in sections where the normal rainfall is less than twelve inches, and where the only way to

get milk from a native cow is to rope and throw her and take it away by force.

And the improvement of farming is a subject which may well challenge the attention of the American people, irrespective of their occupation or avocation. With the growth of our population there must soon come an improvement in our methods of farming. We have now occupied practically all of our crop-producing land. We have heretofore been a nation of soil robbers. As long as there was new land to be possessed, we worried little about wasted fertility. While we were harvesting the fertility of the ages, crop production was measured largely by the work expended. The most successful farmer was he who could work and work his dependents longest and hardest. But when successive crops have taken out of the soil the fertility which is immediately available, the farmer who grows a crop that will bring him more than it costs must learn how to unlock the reserve store which nature yields only to him who has studied her laws. He must use brains as well as strength. He must learn how to restore the fertility which he took away. He must learn the laws of breeding and feeding live stock. He must learn how to grow larger crops on less land. He must learn how to combat the various insect pests which multiply under ignorant farming. He must learn how to protect his crops from the ravages of various low forms of parasitic plant life. These things are not to be learned from the so-called practical farmer. However skillful he may become in the art of farming, he can learn the science only from the scientist or from the scientific farmer.

Hence the education of the farmer becomes a matter of the greatest moment to the nation at large. Our population is increasing and must be fed. Our land is practically occupied. Within a comparatively few years, as we measure time in a large way, we must increase our crop yields or go hungry. More intensive farming in the way of better cultural methods will temporarily increase the yield per acre. The labor now put upon a quarter

section will, if intelligently expended on eighty acres, give as great or greater returns. But improvement in the art of "tickling the earth" is but a temporary expedient. The store of fertility in the soil is limited. If taken away year by year, and nothing returned, it will be exhausted as certainly as is the vein of coal. Improved cultivation alone acts upon the soil as a stimulant does upon the human organism — it exhausts its strength all the more rapidly. The great problem with which as a nation we are confronted is not alone that of growing greater crops, but of doing this and at the same time so conserving the soil that we, and our sons after us, may continue to grow them, and this problem can be solved only by the educated, scientific farmer.

It is the purpose of this paper, therefore, to consider what we have been and are now doing to educate the boys and young men who are to be the farmers of the future, and to tentatively suggest some things we should do hereafter, if we work out this problem as satisfactorily as we have heretofore worked out other problems of similar importance. To this end I propose to outline as briefly as possible the general methods of education followed in some advanced foreign countries, and contrast them with our own; second, to deal with secondary agricultural education in foreign countries; third, to discuss the condition in this state and offer some suggestions as to the methods by which it might be improved. My information on the school systems of foreign countries has been gathered and appropriated from a general reading of everything I have been able to find bearing on the subject. The best single work I have found is "Making of a Citizen," by Robert Edward Hughes, of Oxford.

The German System

As one writer has put it, the German school system has long been the admiration of the pedagogic world. It is designed not alone to impart knowledge, but to make citizens. It is a national

interest. The system is bureaucratic. A minister of ecclesiastical education and medical affairs directs the educational work of the nation. The school officials are officers of the state. They appoint and dismiss teachers. They prescribe what is to be taught. The people at large have nothing to say concerning the manner in which the school shall be conducted. Education is compulsory, and it is estimated that fully 90 per cent of the total enrollment is daily in attendance at school. Going to school is a national habit. Parents are held strictly accountable for the attendance of their children, and are fined for each day the child is absent without good reason. If the fine is not paid, they are sent to jail. The schools are very largely supported by the state. City schools receive about one third of the amount required to conduct them, the amount varying in proportion as the city is able to pay. Country schools receive about two thirds of their total expense from the state. The atmosphere of the schools is distinctly religious. In no country are the teachers so thoroughly prepared. Teaching in Germany is a profession, and the teacher ranks high in the social scale. It is said that one fifth of the teachers are the sons of teachers. One third of them come from the agricultural people. The German teacher is trained through a period of six years, first as a pupil in the normal preparatory school, then for three years a student in the normal college, and before being placed in full charge of classes must undergo a course of preparatory training in actual school work, as an assistant teacher and under the direction of a head teacher, and subject to frequent inspection and examination by government inspectors. The result is that German instruction is thorough and consistent. Being an officer of the state, the German teacher is pensioned after ten years of service, if he retires because of disability, and is retired on a full-service pension at the age of sixty-five.

The system of secondary schools is complete, and adapted to the needs of the various classes of German society. Three

secondary schools have six-year courses and three others nine-year courses. The work covered in the nine-year schools is equal to the courses of many leading universities of other lands. The teachers in the secondary schools of Germany are said to be the finest body of teachers in the world. They must first complete the nine years' course; second, they must attend for three years in the university; third, they must meet special state examinations. After having done this, they are assigned to certain secondary schools under the care of the director. During the first year they do not teach at all, but watch the teachers at their work. Next they are permitted to teach two hours weekly in the presence of the director and regular teachers. Then comes the trial year, during which they teach regularly, a part of the time under the eye of a director. They then prepare a written report of progress made, and this report, together with that of the director upon the candidate's work, is sent to the provincial board, which appoints the candidate to a permanent place. The supply of teachers is plentiful, and very often the candidate must wait for some little time before securing his position. Having once got into the work, however, his tenure is secure. With such a system and with such teachers it is not surprising that the Germans are in many respects the best educated people in the world.

The French System

Like the German, the French system of education is national in its character and bureaucratic in its administration. The head is the minister of public instruction, who has about him an advisory council of sixty members. Of these, three fourths are appointed by the professors and teachers, and one fourth by the president. The minister of public instruction keeps in very close touch with the work of the schools throughout the nation, through ten general inspectors and a large number of primary

inspectors, who make their headquarters at Paris. The system is divided into seventeen academies, each academy being composed of the local university and all the secondary and primary schools within its area. These academies are presided over by rectors, appointed by the president. They are in turn divided into departments, with a civil head, the prefect, for each department. He appoints the teachers from a list drawn up by the academy inspectors, of which there is one to each department. Under this inspector are the primary inspectors, numbering between four hundred fifty and five hundred, each one having the supervision of about one hundred fifty schools. The departmental council, made up of fourteen members, constitutes the departmental board of education. This council is composed of four counselors elected by the teachers, the directors of the normal training college, two primary inspectors appointed by the minister of education, and two male and two female primary teachers elected by the teachers of the department. This council supervises the courses of study, methods of instruction, and has general supervision of the schools. The people have little to say concerning the education given their children. Compulsory education goes to the extent of even supervising the instruction given children in private schools and families — the children under special teachers at home being examined at the end of each year by a committee, of which the primary inspector is chairman; and if the result of the examination is not satisfactory, parents are required to send the children to either public or private schools. This system is not followed so closely now as some years ago. A list of the children of school age is made up each year, and if the children are not in school, or if a reasonable excuse is not furnished for absence, the parents are warned, and if warned twice within a year, they are fined. The laws concerning the employment of children are strict. Nothing is permitted to come between a child and his opportunity for at least a primary education.

The state pays the teachers of the primary and infant schools, of the higher primary and manual-training schools, and of the normal schools; also it pays all inspectors and other officials, and their traveling expenses. The department pays a certain sum per annum to each primary inspector. The state contributes from 50 to 70 per cent of the cost of maintaining the public primary schools and in some cases even more. In the cities the cost is mostly borne by the municipality. Between six and seven thousand of the primary schools are provided with gymnasiums, and nearly one thousand have workshops for manual training. In the cities practically every boys' school is provided with a manual-training workshop, and manual training is compulsory. In the neighborhood of sixty thousand primary schools have school gardens. The nation controls the secondary schools as completely as the primary. There are two principal secondary schools in France — the *lycée* and the Communal College. Children enter the *lycée* at eight years and graduate at eighteen, with the degree of Bachelor of the University of France. Those who wish to do so remain for two years longer, and thus obtain exemption from two years' military service. The work in the *lycée* is absolutely regulated by the state, and is uniform throughout all of the schools. The Communal College is a local institution, although the state contributes materially to its support.

As in Germany, the teachers in France are employees of the state. The preparation of teachers is of the same general nature as in Germany, but not so thorough. The requirements, so far as mental equipment is concerned, are strict, but there is less attention given to the ability of the teacher to teach. The teacher's promotion depends, however, upon his individual ability, and there is less difference in the wages paid teachers in classes. They are entitled to a pension at sixty years of age, and in case of death a certain portion of this pension passes on

to the widow. The pension fund is accumulated in large part by a deduction of 5 per cent per annum from the teacher's salary.

The English System

The English nation was the last of the great nations to admit the obligation or the desirability of the state to educate or even partially educate its youth. Not until 1870 were there any state schools in England. Education was secured entirely at private schools, some of which, however, received financial aid from the government. The educational act of 1870, and those which followed, resulted in placing schools within reach of practically all the children in England and Wales. The schools are controlled entirely by the communities in which they are located, but certain conditions are imposed before they can secure funds from the Board of Education. The law requires every child between the years of five and fourteen to attend every session of the school unless he is receiving instruction elsewhere or is exempt because twelve years of age and of a standard proficiency; or thirteen years of age and has made, for five consecutive years, three hundred fifty attendances per annum. There are further exemptions in the case of country children. The percentage of attendance has been steadily increasing, the average for children over seven years of age running close to 90 per cent. When the educational act was passed, the number of children in the schools was less than 8 per cent of the population. The number now is nearly 20 per cent. Between eight and ten thousand savings banks are established at the primary schools and about the same number of school libraries.

The English teachers are of four different classes: certificated teachers, assistant teachers, additional teachers, and pupil teachers.

The certificated teachers hold their certificates from the Board of Education; these certificates are for life, and these teachers are entitled to a pension at sixty-five years of age.

Assistant teachers are those who have passed certain examinations but have not had normal-school training. The examination is one held by the government for the selection of candidates for training colleges.

Additional teachers are those who have had no professional training of any sort. They are young women approved by the government inspector without examination.

Pupil teachers are engaged by the school management and are fifteen to eighteen years of age. They teach under the superintendence of the head teachers and receive suitable instruction while teaching.

The pension fund is made up of contributions by the teachers, supplemented by the government. These contributions are used to purchase an annuity at retiring age, which averages something over three hundred twenty dollars for male teachers and two hundred ten dollars for females.

From the pedagogic viewpoint the educational systems of Germany and France are admirable. They are well administered, economical, and efficient. There is no lost motion. In these countries, and in England as well, the lines of class are firmly drawn, and the educational systems are devised to give the youth of each particular class the kind of knowledge and early training which will make them most useful for service in that class. The life work of the youth in any particular class is determined at an early age, and his schooling is such as to fit him, so far as possible, for that particular work. The opportunity for the boy of one class to break through the barriers into the class above him are limited, and hedged about in every way, and the educational systems do little to break down these barriers. On this subject Dr. Andrew S. Draper, commissioner of education of New York, says:

"The English purpose would have every English child read and write and work. England has simple but effective elemental

schools for the peasant class. All peasant children go to them. Although they know nothing of American opportunities, the percentage of illiteracy is lower than in our American states. Of course England has schools for the higher classes, but there is no educational mixing of classes and no articulation or continuity of work. The controlling influence in English politics is distinctly opposed to universalizing education through fear of unsettling the status and letting loose the ambition of the serving classes.

"So it is also in France. Notwithstanding the republican form of government, the thought of a thousand years is controlling. The children of the masses are trained for service, and humble service, though possibly somewhat higher than across the Channel. They are trained for examinations and for routine rather than for power.

"There is more to admire in the German purpose and plan, for ambition and determination are not lacking in the nation, and the kaiser knows that the material strength and the military power of the German Empire rest upon the intelligence of the German masses and the productivity of German labor."

The American System

The American system, or lack of system, as some are disposed to regard it, could exist only in such a country as America. While the national government has, especially since the middle of the last century, taken an active part in encouraging educational work, and has from time to time given large tracts of land and made large money appropriations for educational purposes, its part has been to encourage, not to direct or control. Through the Bureau of Education the nation collects a vast amount of helpful information, and its influence in educational matters is steadily growing — not through any additional powers which may have been given it, but through recognition, by those who bear the responsibility, of its ability to help them.

In the founding of this nation there was no recognition of the need of general education. That came with the working out of democratic government, and it came slowly. Not until some time after the Constitution was adopted did our forbears begin to see that the instruction of the youth of the land was a matter which must engage their earnest attention. But when they were once squared away to the real task before them, when it was finally settled that this would be a government by the people, when it was determined that the citizen was the sovereign, they were not long in coming to the conclusion that the sovereign must know something if he was to rule intelligently; that he must be educated. And as all citizens were equally sovereigns, so all must have equal opportunities so far as the state was concerned. And so it came about that as the people pushed west and new states were formed, the duty of the state to educate its youth was written into the constitution, and the subject of education became more and more important in the eyes of the people. With each succeeding generation the desire of the parents that their children shall have the education which they failed to get has grown until it has become almost a passion.

Without central control or direction it was inevitable that there should be no general educational system. Each state evolved the plan which seemed best suited to its needs and conditions. In some states we have the school district as the unit, the districts varying in size according to the density of population. In others the township is the unit. In still others, more particularly the Southern States, the county.

The full time — indeed, much more than the time permitted for a paper of this sort — could be consumed in tracing the development of our public-school system. There were many efforts to engraft upon it the French system of centralized control in some of its important features. Jefferson suggested such a

scheme for Virginia in 1817. At least one state and possibly others provided by law for some of the essential features of a thorough state system. All of these efforts failed. Our systems of secondary education, as we now have them in our splendid high schools, have been developed only in the last sixty or seventy years. Prior to that time secondary education had to be acquired in the academies which succeeded the old grammar schools, the latter being mostly allied to some particular college. These grammar schools, and academies as well, were conducted for the purpose of preparing students for the colleges and universities; they were almost entirely schools for boys, and naturally for those boys whose parents were in better than average circumstances. They were, to a considerable extent, therefore, class schools, entirely different from our democratic high schools.

Not until very recent years has the education of the farmer attracted the attention even of leaders in educational thought. Back in the sixties Justin Morrill secured the enactment of the law which has always been known by his name, establishing the land-grant agricultural colleges. But there has been no general or even local plan for giving the boys of the farm a secondary education which would prepare them for these colleges. In their earlier years the requirements for admission to the state agricultural colleges were not so high, and the bright boy from the country was able to secure admission — if not to the regular college classes, at least to the preparatory classes, which his strong young body and vigorous mind enabled him to wade through in a short time. As time went on, however, the agricultural colleges became more ambitious, and gradually raised their standards, until now from Iowa east the boy who secures admission to the freshman class must bring with him either a certificate from an accredited four-year high school, or must be able to pass examinations which are practically equivalent to the work of a high school of that class. We have, in short, gradually

built up the walls surrounding the agricultural colleges, and neglected, at the same time, to provide, within convenient reach, ladders by which they might be scaled by the boy from the farm. This compels the farm boy to spend three or four years in the town or city high school before he can prepare himself to enter the agricultural college. The training he gets at the average high school is not the sort of training which is likely to keep his thoughts directed toward the farm. He goes with the ambition to excel in his studies. He too often discovers that excellence in studies is not the most honorable accomplishment in the eyes of the student body. He finds that the "shark" is very often considered a freak; that the energy and enthusiasm which should be conserved for those things which make for efficiency in life, for lack of better direction, find an outlet in one-sided athletics; that the student body is divided up into classes and sets by fraternities, or, if these are forbidden, — as they are now in many high schools, — by clubs which form their equivalent; and that too often foolish fathers and silly mothers encourage immature society life. It requires a boy of more than ordinary steadfastness to pass through four years of this sort of thing without being weaned away from the farm. The number which does finally reach the college is very small, and the number that goes back to the farm from the college still smaller. Even if this condition did not exist, — if we had an easy road from the farm to the college, — we should not have made any material progress in giving a knowledge of the principles of agriculture to the men who are to cultivate the farms of Iowa. Not one fourth of one per cent of our future farmers can ever be expected to go through the agricultural college. If we are to give agricultural instruction to the boys who are to do the farming, it must be given in local schools. And the future of Iowa agriculture will be determined by the wisdom with which we work out this problem.

Agricultural Teaching in Foreign Countries

What follows is a very much abridged quotation from a monograph on agricultural education, by James Ralph Jewell, published by the United States Bureau of Education:

"A thorough and comprehensive system of agricultural education is of more importance to France than to many other countries, because, owing to the law of divided inheritance, most of the sons of French peasants will one day have strips of land of their own. France has an excellent agricultural system, and the agricultural schools which the government ranks as secondary are really on a par with the higher institutions of several other countries. Instead of maintaining a large number of small secondary schools, France supports three large national agricultural schools in widely separated districts. The course of study covers two years, and is arranged to meet the needs of the various sections of the country. One school is devoted especially to vine and olive culture, sheep farming, the breeding of silkworms, and the making of wine and olive oil. Another pays especial attention to cider making, pasturing, farming on the share system, and the agricultural products of most importance in western France. Another deals especially with artificial pasturage, cultivation of cereals, stock breeding, and the wine industries of northern France. The students of all these schools must spend their vacations on farms and report what takes place there. There are, in addition, four special schools, one devoted to horticulture, one to agricultural industries, one to dairy farming, and the colonial agricultural school at Tunis.

"In Belgium there are both agricultural schools and agricultural sections. The schools give exclusively professional instruction, while in the sections a part of the time is given to the general education of the students. The schools have a three-year course with one exception, where the course is but two years. They are for

farmers' sons who intend to continue in their fathers' vocations. Tuition is free, and the state gives scholarships to deserving students, all of whom must have been through the elementary schools. There are eighteen of these schools in Belgium, and a government official says of them: 'The greatest service these schools have rendered has been to raise the agricultural profession to an interesting art, which fascinates the learner, and which he never desires to abandon.' In the agricultural sections young farmers may get a general as well as a professional education. Thirty public and private secondary schools give short courses in agriculture and horticulture, one each week through the year. There are four agricultural sections for girls and several high schools of agriculture, with courses of at least two years, for girls. There are four dairy schools for young men in various provinces, with four months' courses, to provide managers for dairies. There are also ten traveling dairy schools for women, giving four months' courses of a notably high grade. Two hours a day, six days a week, are devoted to theoretical instruction and three hours daily to practical work.

"In Holland there are six permanent winter schools of agriculture and horticulture in session from October to April, and a two years' course of study. They are intended for the sons of small farmers and market gardeners. There are also four horticultural schools.

"Finland supports secondary agricultural schools at two different points, as well as at the University of Helsingfors. These courses are for two years.

"In Denmark there are numerous agricultural trade schools, which have grown largely during the past ten years. Since 1892 the state has granted funds to any people's high school which teaches agriculture and gardening, the limit being seven hundred dollars annually to any one school. The agricultural schools and the high schools of Denmark are so closely connected that in

some parts of the country it is difficult, if not impossible, to distinguish between them.

" In Sweden there are two agricultural high schools, each with a two years' course.

" In every province in Germany there is an agricultural school.

" In Switzerland there are four theoretical and practical schools of agriculture, the theoretical work being given during the winter, so as to leave the summer for outdoor work. In addition, winter courses are given for those unable to attend the full course.

" In Portugal there are two secondary agricultural schools.

" In Japan a secondary agricultural school may be established by any city, town, or village when the local finances permit, without detriment to the elementary schools of the place, and the government gives a subsidy to each such school running for five years. In 1904 there were fifty-seven of these schools, with 7146 pupils, and the number has rapidly increased since then. The course of study is usually one of three years. There are three higher technical schools of agriculture, which devote their energies to special lines, with courses of three years in length."

Secondary Agricultural Education in the United States

In the United States we have made barely a beginning in secondary education for farm boys. Condensing again from Jewell:

"Agricultural high schools supported at least in part by the state are in successful operation in Wisconsin, Alabama, and California. In 1902 the first two of four county high schools in Wisconsin were opened at Menominee and Wausau, the state paying a substantial share of the first cost and afterwards a sum not to exceed half the amount actually expended in such schools. In connection with the school at Menominee is a county training school for rural teachers, which gives the county a body of teachers fairly well trained for rudimentary instruction in agriculture. The annual teachers' institute is made a part of the

agricultural summer school, and the teachers are given special instruction in agriculture, manual training, and domestic economy, instead of reviewing the common branches over and over again. To operate one of these schools costs the farmer twenty cents on each one thousand dollars of his assessment. There are now five such schools in Wisconsin, and twenty-one county training schools for teachers in which agriculture is taught. In 1896 the legislature of Alabama established an agricultural school in each congressional district of the state, — nine in all, — in which agriculture is taught in the seventh to tenth grades inclusive. Over two thousand boys and girls attend these schools annually, and a larger proportion of them are doing definite work in agriculture now than ever before.

"In 1906 a law was enacted in Georgia providing for the establishment of a secondary school of agriculture in each of the eleven congressional districts, the schools to be branches of the State College of Agriculture. The annual income of each of these new schools is estimated at six thousand dollars, but the locality securing the school must furnish not less than two hundred acres of land and necessary equipment in the way of buildings, live stock, machinery, farm implements, and the like. Nine separate buildings are contemplated for each school. The course of study will cover four years, including one year of elementary-school work, and will prepare graduates for entrance to the State College of Agriculture.

"Michigan, in 1903, established ten county normal training schools for rural teachers, in which instruction in elementary agriculture is given during the spring only, so that it really amounts to work in school gardening and to making these teachers somewhat familiar with the better textbooks on agriculture. There are now forty-five of these schools in Michigan. The six normal schools of Missouri give each year a good course in agriculture, two of them devoting to it five periods a week

through the entire year. The California Polytechnic School, at San Luis Obispo, a state institution established in January, 1902, offers secondary courses in agriculture, domestic science, and mechanics, covering a period of three years.

"There are here and there through the country three or four private secondary schools in agriculture maintained without state aid. One of these is a Catholic school at San Francisco. Another is the Mount Hermon School, founded by D. L. Moody, near Northfield, Massachusetts. The third is the National Farm School, at Doylestown, Pennsylvania, a school for Jews; and here and there through the country city high schools have developed quite strong agricultural courses.

"Minnesota has an excellent secondary school in agriculture in connection with her State Agricultural College, and has established another at Crookston, in the northwest part of the state, which offers a three years' course of six months each, to which students from the country are admitted without examination. Popular short courses of one week each are also held at this school. Ten high schools give instruction in agriculture.

"Ohio, Indiana, Illinois, and many other states are rapidly consolidating the rural schools, grading them, and introducing agricultural instruction in the higher grades. In Indiana eighty-two of the ninety-two counties have consolidated schools.

"Nebraska has 5 normal schools which give instruction in agriculture, and 103 high schools in which some phases of the subject are taught. In Ohio there are now 47 township and 39 city high schools which teach agriculture; in Missouri, 61; in Illinois, 11; in Indiana, 11."

The Condition in Iowa

Iowa is the greatest all-round agricultural state in the Union. In intelligence, thrift, and the qualities which go to make good citizenship, her people are believed to be the equal

of the people of any other state and the superior of most. But in the systematic education of her youth she is far behind most other states north of Mason and Dixon's line. Only the length of this paper enables me to resist the temptation to discuss the chaotic condition of our educational system in general. We have about 12,000 rural schools in Iowa, and Superintendent Riggs is authority for the statement that more than 2000 of them never enroll more than ten pupils each in a given term, while many of them enroll less than five. Less than 3000, or about 25 per cent, enroll more than twenty pupils in any given term. And enrollment is not synonymous with attendance. Our efforts as a state to give our youth the knowledge of the principles of agriculture are confined to the work done through the State College of Agriculture. In a few counties progressive county superintendents have voluntarily introduced the study of corn and other grains, and some of the simple nature studies, in the rural schools. The pioneer in this line was Cap. Miller, of Keokuk County. In Page County, Miss Jessie Field caught the spirit and has carried this work still further, until practically every rural school in the county is devoting considerable time each week to studying the simpler things of agriculture. O. H. Benson is doing work of the same sort in Wright County. In other counties here and there, scattered over the state, an occasional real teacher, encouraged by some progressive farmer in the neighborhood, has taken up the work. Some seven or eight high schools and two or three of the smaller colleges of the state have inaugurated some agricultural work.

Nor have we as yet taken even the first step toward remedying this unfortunate condition. While many of our people and many of our teachers understand our shortcomings, no systematic effort has been made toward improvement. While other states are redirecting their rural schools and educating teachers to take charge of them, we are doing nothing at all in this

direction, except that the Extension Department of the college has held one summer institute for country-school teachers in a northwestern county.

The work of the Iowa Agricultural College consists of:

First, providing various four-year courses in agriculture, civil and mechanical engineering, veterinary science, and general and domestic science. These are open to students from accredited high schools, or to those who can pass an examination of the same grade.

Second, a special two years' course in agriculture, to which are admitted students who cannot meet the entrance requirements to the regular course.

Third, experimental work in agriculture, carried on by the Experiment Station, which is supported in part by the national government. The results of this work are disseminated in the form of bulletins, which are sent free to residents of the state who apply for them.

Fourth, a two weeks' course in agriculture, open to boys and men of any age, at which are taught corn and live-stock judging, dairying, etc.

Fifth, extension work which is carried on by a special corps of instructors, who conduct short courses of one week each in various counties of the state, twenty-one being planned for this winter. The Extension Department also publishes bulletins written in popular form and mans the special trains run by the railroads.

The Agricultural College graduated its first class in 1872. From a list of the alumni published by the college in January, 1910, and which therefore does not include the class of 1910, I find that a total of 362 have been graduated with degrees of Bachelor of Agriculture and Bachelor of Scientific Agriculture. Of these there are 9 whose addresses are not known, 5 are dead, 212 reside outside of Iowa, and 136 reside in Iowa. How

many of those remaining in the state are on farms or engaged in agricultural pursuits I have not been able to ascertain. It is of course true that many times this number of students have studied agriculture at this institution one or more terms. The number this year, reported in the four-year courses in the agricultural department, is 703, while there are 134 in the special two-year course. Better work is now being done at the college than at any previous time, but the figures quoted show how far short it falls of meeting our real needs. We have more than two hundred thousand farms in the state of Iowa, and it is perfectly evident that if any considerable percentage of the boys who will till these farms in the future are to have even a partial knowledge of the principles of agriculture, they must get it elsewhere than at the State Agricultural College. It is worthy of note that the total enrollment in all the state agricultural colleges of the Union, not including the schools for colored people and not including the short and special courses, was 61,662 for the year 1909, and of this number but 5873 were enrolled in the agricultural courses; or about 9½ per cent of the students of the agricultural colleges studied agriculture.

For the year ending June 30, 1910, our State Agricultural College received for educational support $276,935; for fees and tuition, $58,244; for scholarship fund, $1350; for agricultural extension work, $32,000; for experiment work, $78,000; and for building and equipment fund, $163,815; or a total of over $610,000 during one year. During the last five years $718,526 was expended for building purposes, included in this being $329,934 for a hall of agriculture.

The work of the short course which is held at the college for two weeks during the winter vacation, and the work of the Extension Department, is designed not to furnish an agricultural education, but to give to the practical farmer information of a quasi-scientific character, and to stimulate interest in better

farming. The Extension Department is doing by word of mouth what the better agricultural papers have been doing for years in a very much larger way by the printed page. The state is getting very much greater direct material benefit for the money it spends in this extension work than for any other money spent through the Agricultural College. This benefit comes not alone from the knowledge imparted. The best teaching is not the imparting of knowledge, but the creating of an appetite for it, inspiring the desire to learn and know. We can establish better schools only where the people want them and are willing to take the initiative. The extension work prepares the way. The extension worker must be an inspirational teacher. His pupils come to hear him not because they want the credits necessary to secure a diploma, but because they want to learn what he can teach. If he does not interest them, they do not come back. The best teachers in the state are those of the Extension Department — the most unselfish, the most enthusiastic, the most devoted.

But the work being done by the Agricultural College in its various activities — important as this work is — is not the work most necessary for the betterment of Iowa agriculture and for the betterment of the farm boy. We must place the opportunity to secure a knowledge of scientific agriculture within reach of the average boy on the farm. It seems foolish to permit the boy to grow up in ignorance of the things he most needs to know in his business, and then try to teach the man in short courses of a week each year. We should in some way build a system of secondary education designed to meet the needs of the boy who will be a farmer. Ignorant men cannot long cultivate lands worth two hundred dollars an acre. The prosperity of Iowa depends upon the intelligence of the men who till her farms. The resident of the town and city must, for his own preservation, aid in placing the right sort of education within reach of the farm boy.

In conclusion, I have not an elaborately worked-out system to propose, but I suggest certain lines along which we should move:

First, we cannot supply agricultural education by legislative dictum. Efforts to enact laws which will require forthwith the teaching of agriculture in all schools or in all rural schools are not well directed.

Second, the state cannot, as in other countries, control entirely the education of its youth, but without more direct aid of the state than has been given in the past we shall make no general progress. This aid can be most effectively given in two ways. (*a*) By training teachers competent to give instruction in agricultural subjects. This should be begun in a wholesale way by a course in agriculture at the State Normal School, by establishing a special summer school for rural teachers at the State Agricultural College, and by holding special short courses for teachers under the direction of the Extension Department in various parts of the state. In these ways we can make a beginning, but at the earliest possible moment we must provide training schools for rural teachers which will really fit them for rural teaching. (*b*) By giving financial aid to rural schools which provide secondary courses. Our people can most easily be induced to spend their own money when by so doing they can get some of the state's money. Only in this way can the state exercise a strong influence upon the character of the rural schools.

Third, the foundation of any real system of agricultural education is the rural school. As a state we have spent so much time and money in fashioning the lily work on the pillars and constructing a band stand on the roof, that we have given almost no attention to the foundation. The first step toward the improvement of the rural school will be in the direction of consolidation. Efforts to introduce agricultural instruction in primary

schools have not been successful. The most that can be done in this direction is to give primary studies an agricultural flavor and interest the children in certain forms of nature work. With the consolidated school, however, grades can be established, and in the higher grades excellent work in agriculture and domestic science can be carried on by competent teachers.

Fourth, we must have a system of secondary agricultural schools open to boys and girls from all the rural schools and planned with especial reference to their needs. The school year should not exceed six months. Our ultimate aim should be to place a first-class secondary school within driving distance of every farm, and these schools should, so far as possible, be in the country and not in the small town, to the end that around them may be built up a rural social life. For lack of teachers it may be necessary first to establish a secondary school in each congressional district, which can later be developed into training schools for teachers; but township high schools should be the goal, and they should be made available at once to every community that is now ready for them. The courses of study at these schools should be planned solely with the purpose of giving the farm boy and girl the education they most need for farming, and not with a view of preparing them to enter the agricultural or any other college. Ninety-five per cent of the pupils who attend them will attend no other school.

Fifth, the Extension Department should be provided with greatly increased funds, that it may be enabled to extend its short-course work and inaugurate a series of institutes at which rural teachers may be given the inspiration which they so much need and the instruction which will enable them to introduce nature work. The state now gives this department $32,000 annually. Last year the communities in which it worked contributed over $31,000. Not less than $100,000 per year should be made available for the sole use of the Extension Department.

Finally, if we wish to improve our schools, we must be willing to spend our money. We have spent freely in the past for our higher educational institutions, which educate the few. We must spend freely in the future for grade and secondary schools to educate the many. This state can well afford to support both. But if to redirect our schools we must redirect our appropriations for education, then let it be done.

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